WP 2014-02
january 2014

Working Paper

Charles H. Dyson School of Applied Economics and Management
Cornell University, Ithaca, New York 14853-7801 USA

Mineral Revenues and Countercyclical Macroeconomic Policy in Kazakhstan

Steven Kyle

It is the Policy of Cornell University actively to support equality of educational and employment opportunity. No person shall be denied admission to any educational program or activity or be denied employment on the basis of any legally prohibited discrimination involving, but not limited to, such factors as race, color, creed, religion, national or ethnic origin, sex, age or handicap. The University is committed to the maintenance of affirmative action programs which will assure the continuation of such equality of opportunity.

Should Mineral Revenues Be Used for Countercyclical Macroeconomic Policy in Kazakhstan?

Steven Kyle
Cornell University
January 2014

ABSTRACT

Kazakhstan's sovereign wealth fund is used as the sole conduit for transferring mineral revenues to the state budget. This paper discusses alternative fiscal rules for use in governing these transfers and focuses in particular on a proposal to use transfers in a countercyclical manner. Though this idea is an excellent one in theory it suffers in practice from the near impossibility of identifying cycles in the national economy, the national budget, or in international oil prices in a time frame that would allow such a policy to be implemented. Numerical simulations show that using the NFRK for short run countercyclical purposes will almost inevitably lead to greater rather than lesser volatility due to the inability to forecast oil prices or the business cycle with any degree of accuracy. Other proposals such as that to allow NFRK investment in domestic assets have the potential to undermine one of the most important successes of macro policy management over the past decade: insulation of the domestic economy from the overheating that can be caused by a too-rapid expansion fueled by oil revenue. Overall, numerical simulation and consideration of various scenarios, including "worst case" or what might be considered remote possibilities shows that the NFRK as currently constituted is well able to deal with any transitory shocks of the nature modeled in this exercise. Given the reality of the extreme political pressures that can arise from sharp downturns beyond those of a "normal" business cycle, it is recommended that the current flexibility built into the NFRK rule be limited both in terms of the size of the shock that would trigger using it and in terms of the length of time such additional transfers might be allowed. Both theoretical and practical considerations suggest that building countercyclical response into the fiscal code in the form of "automatic stabilizers" be accomplished to the extent possible. The recommendations to generated by all of these considerations can be summed up as follows:- First, implement "automatic stabilizers" to the extent possible. - Second, limit the current 15% flexibility clause applying to the NFRK to make specific the size shock that would trigger its use and also to limit the length of time such additional funds could be transferred.

Mineral Revenues and Countercyclical Macroeconomic Policy in Kazakhstan[1]

Steven Kyle
Cornell University
May 2013

I. Kazakhstan's Economy and the Monetary/Fiscal Policy Mix

A. Introduction

Kazakhstan is a rapidly growing country in Central Asia. Formerly part of the USSR, Kazakhstan has emerged as a well managed independent economy with per capita income greater than $12,000 per year, relatively low inflation and manageable debt loads. Poverty has declined sharply in the past decade with less than 6 percent counted as below the poverty line in 2011. Poverty is concentrated in rural areas, and among the unemployed with women and the young suffering the most. (See World Bank 2012b)

Government deficits are clearly under control and both this and the balance of payments reflect the importance of oil exports. This importance will grow over time as newly discovered offshore fields come on line over the next two or three years. Meanwhile, maintaining control of the non-oil budget deficit will remain a key target for policy and policymakers' greatest challenge for the foreseeable future.

The importance of oil is perhaps the most salient feature of the Kazakh economy at the present time – Not only is the stream of oil revenue large and growing (11.5 % of GDP in 2010, 46.5% of government revenue and 57 % of exports) but these large streams condition the goals of monetary and fiscal policy in terms of macroeconomic management. Avoidance of Dutch Disease and other issues related to the Resource Curse are of necessity primary focuses of policy. In fact, the government has done a very good job at avoiding both the chronic real exchange rate difficulties that so often plague mineral exporters as well as the volatility in both policy and price signals that so often underlies poor performance.

Key to the effective management of oil revenues is the use of sovereign wealth funds to save oil revenues overseas so as to sterilize the large foreign exchange inflows generated by mineral exports. Holding more than $73 billion at the end of 2011, these funds and their management are at the center of any future plan for macroeconomic management. Figure 1 shows the spot price for Brent oil since 1997 where the volatility is abundantly obvious. Preventing the transmission to the Kazakh economy of these huge swings is of paramount importance as is avoidance of the problems associated even with relative constant large inflows of foreign exchange.

[1] This paper is based on four papers written for this project on various aspects of macroeconomic management and mineral revenues in Kazakhstan: "Fiscal Rules as Social Insurance: The Case of Kazakhstan" Eduardo Engels and Alexis Montecinos, March 2013; "The National Fund of the Republic of Kazakhstan and Countercyclical Fiscal Policy", Harun Onder & Eduardo Ley, PREM, The World Bank December 2012; "Kazakhstan Macroeconomic Modelling Report" DECPG The World Bank April 2013; "Countercyclical Fiscal and Monetary Policy in Kazakhstan" Steven Kyle, Cornell University, December 2012.

The sovereign wealth fund, the National Fund of the Republic of Kazakhstan (NFRK) serves a dual purpose of stabilization of the macro-economy and accumulation of national savings. It was established in 2000, and has been modified several times. The more recent modifications were implemented in 2007 and 2012. Since 2007, the NFRK receives all fiscal revenues from gas, oil and four metals (chrome, zinc, lead and copper), and makes disbursements to the budget, as enacted by law.

In 2012 The NFRK was modified by the Government of Kazakhstan Presidential Decree 289 (dated March 16, 2012). The annual transfer of funds to the budget was changed from the previously fixed amount of US $8 billion to the flexible amount of US $8 billion plus or minus 15 percent (US $6.8-9.2 billion), depending on the cyclical position of the economy. At the present time it has been established that the next three budgets, subject to revision, will receive a transfer of US $9.2 billion, keeping the transfers pegged at the upper end of the range that has been specified.

Meanwhile, the complementary provisions to prevent government borrowing from "undoing" the NFRK savings remain unchanged. These conditions are that

(i) the government interest debt service cannot exceed 4.5 percent, and that

(ii) the ten-year average of debt interest payments plus rollovers cannot exceed 15 percent of all budget revenues (including NFRK transfers) and

(iii) the balance of the NFRK cannot fall below 20 percent of projected GDP.

To put things in perspective, in 2009, the share of the oil sector in GDP was 25 percent, the share of oil and gas exports in total exports was 67 percent, and oil revenue was 41 percent of budgetary revenue (Lücke, 2010). On average over 2007-2010, the mining sector employed only 2.5 percent of the labor force versus agriculture 30 percent, trade 15 percent, transport and communication 7.5 percent, construction and manufacturing 7 percent each, and real estate 4 percent (IMF 2012).

The non-oil Kazakh economy is heavily dependent on primary commodities, with copper and uranium as important exports, as well as agricultural goods. The worldwide recession that started in 2008-2009 has affected Kazakhstan also, with a collapse in a property market bubble leading to widespread banking troubles and state takeovers of many problem banks.

This is perhaps the greatest systemic issue facing Kazakhstan at the present time – it has never truly moved beyond its soviet era forms of organization in either the economy or in the political sphere. State run enterprises dominate the economy, to the detriment of the private sector, while in the government a single strong leader has dominated since the breakup of the USSR.

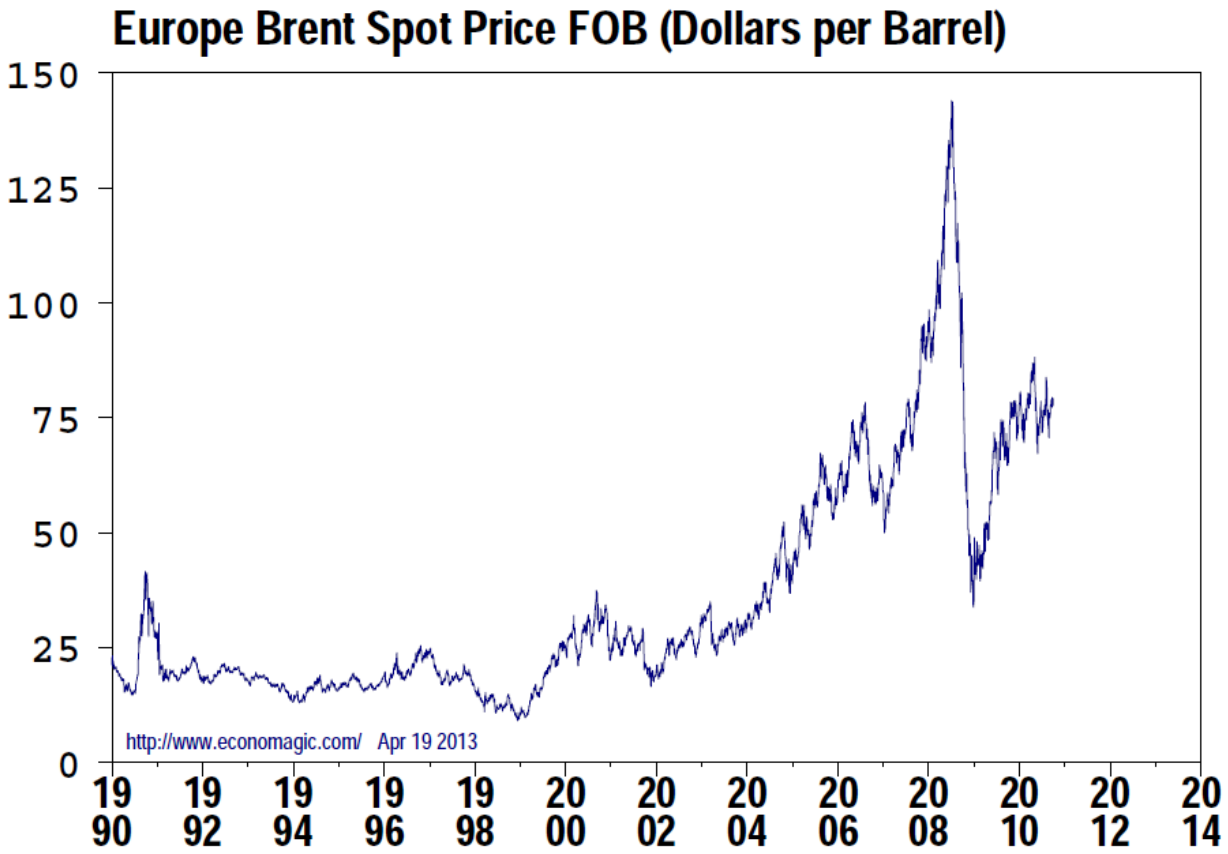


Figure 1 – Brent Spot Price 1990-2013

Though restraint in credit growth is a good thing in an oil economy with a strong potential to overheat, the recent world financial troubles together with the consequent forced deleveraging of banks and their consequent takeovers in Kazakhstan have left the private sector with only a limited capacity for investment credit. While government directed investment has worked well so far, the need for a more market oriented sector will become more and more obvious as time goes on. Government programs to subsidize loans have succeeded in increasing credit by more than 15% in 2011 but nonperforming loans remain a problem in the aftermath of the world financial crisis. (See IMF 2011)

Inflation has remained low with the CPI registering a 5.9% year on year increase as of January 2012, enabling the central bank to reduce interest rates to 7%. Declines in food price inflation have led the way in the fall in overall price levels. The quasi-fixity of the exchange rate, with the tenge varying less than 1% from its 146.5 level against the US Dollar means that the real exchange rate has appreciated by about 5.7% over the past year. (See World Bank 2012) It should be noted that while real appreciation is detrimental to trade exposed sectors (most significantly non-mineral traded sectors such as wheat) it also serves as a channel through which pressure from excess demand or incipient overheating can be vented. Indeed, in the long run as development proceeds and per capita incomes rise we should expect a tendency toward real appreciation (the Balassa Samuelson effect – See Samuelson 1994)

Kazakhstan has had good fiscal management and control over the past decade (World Bank 2012a) with public spending stable at about 22% of GDP and the non-oil deficit averaging about 3% of GDP. This performance is particularly notable in light of the fact that Kazakhstan experienced markedly increased oil revenues during the period but largely avoided the fiscal pitfalls that have plagued so many oil exporting countries. However, after the crisis in 2008-2009 the non oil deficit widened to more than 10% of GDP and was financed by oil revenue saved in the National Fund. In essence, the fund was being used in a countercyclical manner, though on an ad hoc basis in the absence of any rules geared to such eventualities.

Tables 1, 2, 3, and 4 present figures detailing recent developments in the Kazakh economy.

B. Monetary Policy in a Mineral Export Economy

The practical and theoretical case for a stable monetary policy using price stability as a target is by now well established. This is even more clear when the country under discussion is a large mineral exporter, in which case the strict inflation targeting approach can be usefully modified to one intended to target the real exchange rate rather than using some form of a CPI target as is typically done. Another possibility raised in the literature on this topic is to use the primary export commodity price (in this case oil) as part of a target index of prices since this is the source of the major portion of the volatility affecting the economy. (See Hausman 2005, Frankel 2005 and 2011, and Velasco 2005)

The need for economies with significant mineral export sectors to deal with the effects of large foreign exchange inflows so as to avoid real exchange rate appreciation has so many actual examples of economic disasters when it is done poorly (or not done at all) that by this point it is almost repetitive to even rehash the discussion. However, it is worth doing so not only for the sake of completeness, but also to add more recent developments in the literature beyond those which have been known for decades. This older, "Dutch Disease" literature (See, for example, Van de Ploeg 2011 for a recent survey, or Corden 1984 and Gelb 1988 for numerous case studies and a survey of older literature) underscores the role of foreign exchange inflows in bidding up the price of non-traded goods, causing an appreciation of the nominal exchange rate and thereby causing deterioration in non-mineral traded sectors due to adverse moves in the real exchange rate. This stagnation is exacerbated by resource pull effects which cause reallocations away from non-mineral traded sectors (e.g. agriculture) both to mineral (e.g. oil) and to non-traded (e.g. construction) parts of the economy.

Table 1. Kazakhstan: Real GDP Growth and Growth Contributions by Sector, 2008-11

GDP at Current Prices (Billions of Kwanzas)	Real Growth (% change)				Growth Contribution (%)			
	2008	2009	2010	2011	2008	2009	2010	2011
GDP at market prices	**3.3**	**1.2**	**7.3**	**7.5**	**3.3**	**1.2**	**7.3**	**7.5**
GDP at factor cost	3.3	1.6	7.3	7.2	3.1	1.5	6.9	6.8
Extractive sectors	**8.4**	**8.0**	**11.3**	**4.3**	**2.0**	**1.9**	**3.1**	**1.4**
Oil sector	9.5	8.5	11.8	4.1	2.0	1.8	2.9	1.2
Oil extraction, pipeline construction, and oil transportation	8.2	11.6	5.8	1.0	1.5	1.8	1.1	0.2
Refinery and exploration services	1.2	28.8	11.5	5.0	0.0	0.5	0.2	0.1
Retail and wholesale trade of fuel	15.5	-18.2	38.8	15.0	0.5	-0.6	1.5	0.8
Mining (other than oil)	0.2	3.9	7.1	6.0	0.0	0.1	0.2	0.2
Non-extractive sectors	**1.6**	**-0.5**	**5.7**	**8.4**	**1.1**	**-0.3**	**3.8**	**5.4**
Private sector	0.1	0.1	5.8	8.1	0.1	0.1	3.1	4.0
Agriculture	-6.2	13.2	-11.6	26.7	-0.4	0.7	-0.6	1.2
Manufacturing	-3.6	-3.7	13.5	..	-0.4	-0.4	1.2	..
Construction	-26.2	-17.2	1.2	..	-0.7	-0.3	0.0	..
Trade	-0.6	3.5	1.8	..	-0.1	0.3	0.1	..
Transport	6.1	-4.9	5.2	..	0.4	-0.4	0.4	..
Real estate transactions	5.8	1.2	3.4	1.4	0.8	0.2	0.3	0.1
Financial activities	-1.3	-14.9	-12.3	-4.5	-0.1	-0.9	-0.5	-0.2
Public sector	7.1	-2.4	5.2	9.3	1.0	-0.4	0.8	1.4
Consumption	2.6	1.0	2.7	16.0	0.2	0.1	0.3	1.6
Investment	15.5	-8.4	11.0	-5.1	0.8	-0.5	0.5	-0.2
Net taxes on products and imports	3.4	-3.9	6.5	13.1	0.2	-0.2	0.4	0.7

Source: KAZAKHSTAN ECONOMIC UPDATE, NO. 1, 2012

Table 2. Kazakhstan: Balance of Payments, 2008-11

	2008 actual	2009 actual	2010 actual	2011 estimate
	(*In millions of U.S. dollars)*			
Current account	**6,326**	**-4,068**	**3,013**	**13,609**
Trade of goods	33,519	14,969	28,882	46,769
Exports f.o.b.	71,971	43,931	60,838	88,895
Imports f.o.b.	-38,452	-28,962	-31,956	-42,126
Services and income				
Services	-6,694	-5,804	-7,063	-6,054
Income	-19,515	-12,511	-18,325	-26,941
Of which: Income of direct investors (net)	-17,145	-10,846	-16,596	-24,128
Current transfers	-985	-722	-481	-165
Capital and financial account (including Errors & omissions)	**2,343**	**3,412**	**8,318**	**-617**
Direct Investments	13,118	10,082	2,857	8,772
Direct investments abroad	-1,204	-3,158	-7,819	-4,362
Direct investments in Kazakhstan	14,322	13,241	10,677	13,134
Portfolio investments (excluding investments of the National Fund)	-2,898	-65	15,140	152
Other investments (including Errors & omissions)	-7,877	-6,606	-9,679	-9,541
Change in monetary and fiscal reserves ("+" = reserve accumulation)	**8,669**	**-656**	**11,331**	**12,992**
Memorandum items:				
Gross international reserves (stock)	19,872	23,091	28,275	29,323
National Fund reserves (stock)	27,486	24,368	30,980	43,693
Source: KAZAKHSTAN ECONOMIC UPDATE, NO. 1, 2012				

Table 3. Kazakhstan: Government Fiscal Accounts, 2008-11

	2008 actual	2009 actual	2010 actual	2011 estimate
	(*In percent of GDP)*			
Budget non-oil revenue (i.e. tax and non-tax)	16.8	14.1	14.1	13.5
Budget and off-budget expenditures	27.2	27.9	22.8	21.8
Budget outlays	23.4	23.5	22.1	21.8
Budget expenses	20.3	22.0	20.4	19.8
Lending (net)	0.3	0.2	0.1	0.3
Transfers to SOEs (net)	2.8	1.4	1.6	1.7
On-budget transfers and off-budget lending to SOEs	3.8	4.4	0.7	-
Non-oil deficit (incl. off-budget expenses)	**-10.5**	**-13.8**	**-8.7**	**-8.3**
Budget oil revenue (i.e. customs duty on oil exports)	1.7	0.0	0.1	1.8
Use of National Fund (NF) oil revenues	6.7	10.9	6.2	4.4
Total transfers from NF to the budget	6.7	6.5	5.5	4.4
Guaranteed transfer from NF	2.9	5.0	5.5	4.4
Targeted transfer from NF	3.8	1.5	-	-
National Fund bond purchases (off-budget)	-	4.4	0.7	-
State budget deficit	**-2.1**	**-2.9**	**-2.4**	**-2.1**
Deficit financing	2.1	2.9	2.4	2.1
Domestic borrowing (net)	2.1	2.4	1.5	1.5
External borrowing (net)	0.0	0.5	1.0	0.6
Memorandum items:				
Consolidated budget revenue	29.7	22.7	25.0	28.0
Oil revenue saved in NF	4.6	2.1	5.3	8.3
State budget revenue (i.e. oil and non-oil)	25.1	20.6	19.7	19.7
State budget expenditures and net lending	27.2	23.5	22.1	21.8
Consolidated budget balance	**2.5**	**-0.8**	**2.9**	**6.3**
Source: KAZAKHSTAN ECONOMIC UPDATE, NO. 1, 2012				

Table 4. Kazakhstan: Selected Actual and Projected Economic Indicators, 2008-15

	2008	2009	2010	2011	2012	2013	2014	2015
					projections			
	(*Annual percent change, unless otherwise indicated)*							
National accounts and prices								
Real GDP	3.3	1.2	7.3	7.5	6.0	5.8	5.8	5.9
Oil sector (in percentage points)	2.0	1.8	2.9	1.2	1.3	1.3	1.3	1.2
Non-oil sector (in percentage points)	1.3	-0.6	4.4	5.9	4.8	4.5	4.5	4.7
Consumer price index, end of period	9.5	6.2	7.8	7.4	6.0	6.0	6.0	6.0
World oil price, Brent/WTI/Dubai average	36.4	-36.3	28.0	31.6	-5.6	-1.1	-1.1	-1.4
Real exchange rate of tenge per US dollar	-13.0	13.8	-5.2	-5.4	-3.5	-3.0	-2.7	-2.7
	(In billions of US dollars, unless otherwise indicated)							
External accounts								
Current account (in percent of GDP)	4.7	-3.5	2.0	7.3	3.8	3.2	3.0	2.8
Net trade in goods and services	33.5	15.0	28.9	46.8	38.1	39.1	41.3	43.2
Exports of goods and services	72.0	43.9	60.8	88.9	76.4	79.8	83.4	86.9
Imports of goods and services	38.5	29.0	32.0	42.1	38.4	40.6	42.2	43.6
Net foreign direct investments	13.1	10.1	2.9	8.8	11.6	11.4	10.0	8.6
Net banks' borrowing	-2.7	-10.0	-12.5	-0.4	0.0	0.3	0.6	1.0
Gross official FX reserves	47.4	47.5	59.3	73.0	90.8	107.6	124.2	140.2
Gross official FX reserves (in percent of GDP)	35.5	41.2	40.0	39.2	44.2	47.4	49.5	50.4
Total external debt (in percent of GDP)	80.9	97.8	79.8	67.1	65.8	64.0	61.4	58.3
	(In percent of GDP, unless otherwise indicated)							
Fiscal accounts								
Non-oil revenue	16.8	14.1	14.1	13.5	13.5	13.5	13.5	13.5
Expenditures and net lending	27.2	23.5	22.1	21.8	22.9	21.1	20.5	20.1
Non-oil deficit	-10.5	-9.4	-8.0	-8.3	-9.4	-7.6	-7.0	-6.6
Oil revenue	12.9	8.6	10.9	14.5	13.0	12.2	11.8	11.3
Budget oil revenue	8.4	6.5	5.6	6.2	6.8	6.1	5.5	5.1
National Fund revenue	4.6	2.1	5.3	8.3	6.2	6.1	6.3	6.2
Consolidated budget balance	2.5	-0.8	2.9	6.3	3.6	4.6	4.8	4.7
National Fund assets, stock	20.7	26.4	24.4	27.8	30.3	33.4	36.3	38.8
External debt and guarantees, stock	1.6	2.4	2.7	2.7	3.3	3.4	3.2	3.0
Domestic debt and sureties, stock	5.1	7.9	7.9	7.8	8.8	9.1	9.7	10.2
Memorandum items:								
Nominal GDP (in billions of US dollars)	133.4	115.3	148.1	186.2	205.4	226.8	251.0	278.1
Nominal GDP per capita (In US dollars)	8,514	7,165	9,070	11,245	12,276	13,417	14,696	16,109

Atlas GNI per capita (in US dollars)	6,140	6,790	7,500	8,200	10,160	11,640	12,790	14,090
Oil production (in millions of tons)	70.7	76.4	79.5	80.1	82.1	86.7	91.9	97.1
World oil price (in US dollars per barrel)	97.0	61.8	79.0	104.0	98.2	97.1	96.0	94.7

Source: KAZAKHSTAN ECONOMIC UPDATE, NO. 1, 2012

More recently this analysis has been extended to include adverse political and institutional ramifications of resource dependence, as well as to additional economic problems that can arise. One of the most important of these is the issue of real exchange rate volatility which can stem from volatility of resource income, but which could in theory result from anything which causes a stop-go pattern in absorption and/or inflation. Hausman and Rigobon emphasized this in their 2003 article and also in subsequent writings.

In a paper focused on the Kazakh case (Hausman 2005) details some of the pitfalls of a strict inflation targeting approach to monetary policy. In particular, he walks through the standard response such an approach would entail when confronted with shocks such as fiscal expansion, capital inflows, or oil price shocks. In each case, a pure inflation targeting approach would tend to exacerbate short run fluctuations in the real exchange rate, thus in effect making the non-oil traded sector the "shock absorber" for the economy as a whole. This would happen as monetary policy was tightened in response to pressures on price levels from the increased absorption stemming from any of the sources of the shocks. Tighter monetary policy implies higher interest rates and therefore an appreciation of the nominal exchange rate. This is not at all what a policy of economic diversification should aim at in the long run.

Hausman's alternative is to tighten policy through other means (limits on credit expansion through stricter reserve requirements, capital adequacy, or portfolio regulations and fiscal policy) rather than through traditional monetary tightening. In other words, the need to rely solely on centralized monetary policies such as interest rate management to contain the aggregate demand pressures at the root of the problem are limited by "diversifying" policy to other instruments which can bear part of the burden.

It is important to note in this type of situation that a premium remains on the ability of the government to avoid aggregate demand overheating in the first place. Insofar as oil proceeds can be saved offshore, avoiding their transmission to the domestic economy through fiscal policy, the easier will be the task of the authorities to maintain control over both inflation and the real exchange rate. Also, to the extent that monetary policy can be made more effective through development of a deep and liquid domestic financial market, the more real effect will be gained from a given change in interest rates, limiting the extent of incipient appreciation that results from monetary tightening.

This deepening of the domestic financial markets was dealt a setback in the aftermath of the 2008-2009 world financial crisis and may well be further retarded in the event of a major Euro zone crisis in 2013. Certainly, few would now promote the idea floated in 2005 of an effort to promote the use of mortgage backed securities or other CDO's on the scale of what could be envisioned prior to the worldwide meltdown in these markets. Indeed, the popping of

Kazakhstan's own real estate bubble and the state takeover of many private banks has pushed realization of the goal of a deeper financial market off into the future. While it is still a viable and laudable goal, financial market development cannot be pushed too fast in an environment where a large percentage of the participating institutions are state owned and operated.

Jeff Frankel (2010) provides a concise summary of fiscal and monetary policy over the business cycle in a small open economy. His views on fiscal policy are discussed below but one insight that is particularly relevant to the Kazakh case is the idea that simply targeting inflation (as measured by some form of CPI or other readily available index) can result in a somewhat *pro* cyclical monetary policy given the tendency of mineral exporting countries to overheat subsequent to price increases in their main export product. This is in essence the same argument made by Hausman 2005 discussed above. In other words, when oil prices rise we can with almost perfect certainty predict that there will be inflationary pressures in the periods immediately afterwards – This means that we can use the information inherent in the oil price by making monetary policy conditional on it – Rather than simply targeting CPI we can target an index including both CPI *and* the oil price since both are indicators of incipient or actual boom conditions.

One major caveat, looked at in more detail below, can be seen graphically in Figure 1 which shows the evolution of world oil prices over the past 15 years. Detailed numerical analysis is required before conditioning policy responses on such a volatile indicator. It may well be that a variety of instruments including offshore savings, oil production levels, exchange rate policies and others should be considered to reduce the "frontline" role of monetary or fiscal policy in responding to extremely wide and sharp swings.

With or without this added feature, the dedication of monetary policy to stability in prices and therefore real exchange rates seems to be an undisputed feature of prudent macro policy management in a small open economy, particularly an oil exporter. What is less universally accepted in the theoretical literature is the role of fiscal policy, which is the topic of the next section.

C. Keynesians and New Classicals

After the New Classical revolution of the 1980's countercyclical fiscal policy became less fashionable among policy oriented economists and downright anathema to those who were more "pure" in their New Classical mindsets. Even among unreconstructed Keynesians it was generally accepted that the short implementation delays and more easily controlled monetary policy tools were more useful in countering the usual mild business cycles that were experienced in the latter decades of the past century. Fiscal policy was relegated to a back seat at best even in industrialized countries, and this was even more strongly the case when discussing small open economies in lower income countries. Not only was it viewed as unnecessary given the efficacy of monetary policy, but the political nature of the decisions involved did not lend themselves to prudent economic management.

The credit crisis and subsequent downturn in 2008 and thereafter has resulted in some serious rethinking of this former consensus. It is clear that fiscal policy can (indeed must) play a role when the zero lower bound on interest rates is binding, but it is also undergoing some rethinking in smaller, lower income economies, especially those with significant mineral income. This is perhaps due to the fact that large foreign exchange inflows and their associated fiscal volatility and pressures have a rather obvious contribution to the instability often seen in such mineral economies, but it is also related to the fact that these fiscal flows are also subject to a greater degree of control and rule-based management than non-mineral budgets often are.

In the recent developed country literature on fiscal stimulus (See for example Blanchard and Perotti 2002, Romer and Romer 2010, Taylor 2011 for just a small sample) the ongoing debate between new classical economists (who eschew nearly all proposals to use fiscal policy as a stabilizing instrument) and those of a more Keynesian persuasion (who see it as necessary in some situations) remains in evidence. Even those who promote the idea of a stimulus in the current "Keynesian" conditions (i.e. zero lower bound on interest rates is binding) do so in the context of a long run adherence to a sustainable deficit and debt. This is certainly true of the IMF which conceded in its recent October 2012 World Economic Outlook that fiscal multipliers were larger than they had originally anticipated and that austerity in the EU was provoking stagnation and a return to recession.

The estimates of fiscal multipliers contained in Kopits and Symansky (1998) are a testament to these alternative views of how the economy works. Purely Keynesian models with adaptive expectations have fiscal multipliers as high as 2 while rational expectations models feature much lower or even negative values. It is likely that "truth" lies in both views, depending on current conditions in the economy. That is, when there is significant unused capacity and labor it is likely that higher multipliers are more relevant than in the full employment situation often implicitly or explicitly assumed in New Classical models.

Few if any of the contenders in this debate would deny that monetary policy can and should be the tool of first resort in "normal" business cycle fluctuations – that is, when downturns are the product of the usual inventory/supply response or the normal workings of the credit market, monetary policy is the first best tool to prevent excessive fluctuations from being transmitted to employment and production.

Two important considerations must be kept in mind however, since Kazakhstan is not yet a fully developed economy as are those countries in Europe and North America who are the most frequent subjects of the ongoing debate:

1. It is not entirely accurate to say that monetary policy is the *only* policy used in most cases in developed industrial economy due to the fact that these economies have a very well developed system of automatic stabilizers which are in effect a fiscal policy implemented on the basis of rules rather than via one-off political decisions or appropriations by the legislature or executive powers. They play an important role in smoothing out business cycles in the USA and Europe and also to a somewhat more limited degree, in lower income countries as well.

The most important of these automatic stabilizers is the tax code. Written to tax incomes and profits, it naturally takes in more revenue when incomes and profits are high and less when there is a downturn. The natural dampening effect of this is increased to the extent that the tax system is progressive – i.e. if tax rates increase as incomes and profits go up. Other important elements of the automatic stabilizers are those elements of the fiscal budget which are intended to provide a social safety net. For example, unemployment payments naturally go up when workers are thrown out of work, and any cash or in-kind assistance to indigent or unemployed citizens is also countercyclical in effect.

To the extent that these types of stabilization functions can be achieved in Kazakhstan by automatically functioning systems rather than as a result of the political process, they are likely to be timely enough to serve as viable instruments of countercyclical policy. Otherwise, the main criticism of fiscal policy in this context that it is as likely to be destabilizing as stabilizing due to the delays and poor targeting inherent in the political process - is likely to be true. Milton Friedman famously likened such a situation to a "fool in the shower" who impatiently turns up the hot water and scalds himself rather than waiting for the results of previous adjustments to take effect.

2. The use of monetary policy as a viable countercyclical instrument depends crucially on the financial depth of the economy. That is, only those economic entities which have a link to the national financial system can be directly affected by changes in interest rates. Those economies which are highly financialized as is the case in the US and in many countries in Europe can reasonably expect a higher interest rate engineered by the central bank to be felt fairly directly by a broad based portion of the national productive and consuming base. The broader the use of the financial system, and the more integral it is in the economic lives of the entities that use it, the more effective a given change in interest rates can be in affecting real economic activity.

D. Fiscal Policy, Dutch Disease, and the Resource Curse in a Mineral Export Economy

The importance of fiscal linkages in the macro management of mineral export revenues is, as noted above, so well known at this point that it is virtually a cliché. The surveys by Corden 1984 and the case studies by Gelb et. al. 1988 exemplify the conventional wisdom reached by the economics profession as a result largely of the oil booms of the 1970's but equally applicable to mineral export booms of whatever origin.

In a nutshell, one of the most obvious channels for oil revenue to exert its influence on the economy occurs when these flows accrue directly to the central government. This is not to ignore the potential for heightened spending from other sources to generate overheating and real exchange rate effects. Rather, given the fact that central governments are often the primary channel through which these effects are felt, and are themselves the only agents in a position to do something about it, the analysis of these linkages is key to any resolution of the distortions that can often plague such economies.

First and foremost, any spending on the part of the government can give rise to real exchange rate pressures insofar as this spending falls on non-traded goods thereby sparking price increases which are more marked the more inelastic the supply of these goods. As these prices rise, the real exchange rate appreciates, which places the burden of adjustment disproportionately on non-mineral traded sectors. These stagnate or collapse entirely in the long run. This is the classic case commonly known as "Dutch Disease".

Second, the composition of spending by the government is a key factor in the development of these problems. Insofar as spending is directed toward imports, domestic demand pressures can be avoided and the tendency toward real appreciation minimized. However, even in the case where spending is directed primarily at imports there is an inevitable tendency for ancillary spending and costs on home goods to increase *pari passu* with the increase in imports.

Third, massive and sudden increases in revenue tend to heighten the importance of the central government budget vis a vis the rest of the economy, putting a premium on rent seeking behavior and creating a tendency toward centralization of activity in the capital city. This and related problems have generated a large literature on the "resource curse" in which countries "fortunate" enough to have significant mineral income can actually grow more slowly than those without. Auty 2001 and Robinson et. al. 2006 provide good surveys of the literature on the political economy of the resource curse.

All of these considerations have resulted in economic policy advice which places a high premium on fiscal management and control as a first defense against the distortions to which mineral economies are so often prone. Avoidance of excessive spending, close attention to the composition of that spending, and avoidance of overheating in the domestic economy are tenets which are by now well accepted both by mineral economy policymakers and outside observers.

Obviously, there is a need for policies which can ameliorate the distortions so common to mineral exporters while at the same time maintaining sovereign control over spending and wealth. The use of offshore sovereign wealth funds is perhaps the most widely promoted and widely used way of achieving this. Essentially, mineral income is paid into an offshore account rather than fed directly into the state budget in order to better control and smooth the fiscal flows. This allows both maximization of intertemporal optimality and a dampening of the sometimes extremely volatile flows of mineral income.

Indeed, as noted by Hausman and Rigobon 2003 and elaborated in subsequent work by various authors, it is this volatility itself that is the source of many of the problems seen in mineral exporters. While adverse real exchange rate movements can indeed have a depressing effect on non-oil traded sectors they are not necessarily the primary cause of decline in cases where there is still an average profit margin capable of stimulating production. Key to understanding this is the use of the word "average" in the preceding sentence – Though average profitability may look good, a volatile real exchange rate generated by volatile mineral revenues and stop-go fiscal spending patterns can cause so much uncertainty that producers flee to other sectors where profits are more assured on an ongoing basis.

It is important to note in relation to all of the above considerations that the Kazakh government has performed exceedingly well in managing the oil boom of the past decade or so. Fiscal control has been exemplary and the management of the sovereign wealth fund created to manage oil revenues has been close enough to "best practice" that it could be used as an example for other countries. Section II below goes into more detail on Kazakhstan's sovereign wealth fund, its management, and proposals for further improvements.

E. Cross Country Empirical Evidence on Fiscal Policy and Economic Cycles in Mineral Export Economies

In addition to the theoretical studies summarized above, there are some cross country empirical studies of the performance of fiscal policy in mineral export economies. Some of these are summarized in this section.

Erbil (2011) studies the question of procyclicality of fiscal policy in oil producing countries. In his study of 28 oil producers he finds that spending is strongly procyclical in low and middle income countries (Kazakhstan is a middle income country) but is countercyclical in higher income countries. This last result in high income countries is, however, conditional on various measures of political and institutional factors – This implies that though Kazakhstan is about to "graduate" to high income status, its ability to use its financial cushions and safeguards adequately in the future will depend on the extent to which political and institutional development can provide the necessary framework to do so. This makes establishment of the necessary fiscal rules and the consensus to adhere to them of paramount importance.

Sturm et. al. (2009) support the use of monetary policy to contain inflationary pressures thus allowing fiscal policy to be freed from the need to support this target. The two main issues remaining are the structure and the phasing of fiscal expenditures. The structure is of course related to the perennial questions of investment vs. consumption and within these, the sectoral composition of spending. Phasing relates more directly to the topic of this paper and Sturm et. al. support attempts to make spending countercyclical but nevertheless recognize the difficulty of doing this in the context of large investment projects.

Villafuerte and Murphy (2010) study the fiscal performance of oil producing countries over the 2003-2009 period. They find that non-oil primary balances worsened during the first part of the cycle but reversed in 2009 when oil prices fell. They also find evidence of procyclicality in fiscal spending over the business cycle.

Van der Ploeg and Poelhekke (2009) provide additional evidence that volatility of various measures of growth can swamp or even reverse the beneficial effects of resource revenue. Thus, the damping feature of sovereign wealth funds is of paramount importance in providing a good context for growth and avoiding the pitfalls of the resource curse.

II. Fiscal Rules and the National Fund of the Republic of Kazakhstan

A. Fiscal Rules and Countercyclical Policy

Frankel (2010), as well as Arezki et al. (2011) show how different fiscal rules can make such mineral income vary from pro cyclical to counter cyclical to anywhere in between. Clearly, pro cyclicality is something to be avoided if possible but it is a natural result of some of the simpler budget rules which can be applied. Simple balanced budget rules result in economic instability that mirrors that of the mineral export sector as money is spent as it comes in rather than being saved. Another rule which is gaining in popularity following its successful application in Chile is what is sometimes called a Structural Surplus Rule, which targets a long run government surplus (or deficit) which is derived from some version of the long run sustainable payout from a sovereign wealth fund based on an exportable mineral resource. Such a rule allows countercyclical payouts when in a downward phase of the cycle to be balanced by added savings when in a boom phase.

The main pitfall associated with such a rule is in arriving at a non-political estimate of what long run trends are in export prices, physical production and GDP. While smoothing deviations from trend is always the goal of the welfare maximization, history tells us that politicians can be counted on to bias estimates in favor of current spending, particularly when they are soon to be engaged in an election.

Kumhof and Laxton (2010) analyze the problem of executing countercyclical fiscal policy in a small open economy with significant mineral income and consider the "optimal" degree of countercyclicality. The SSR rule above can indeed be countercyclical and can thus be demonstrated to have superior welfare properties than does a rule which results in cyclical neutrality or procyclicality. Kumhof and Laxton extend this by asking if some countercyclical policy is good, might not still more be even better? After all, the SSR rule above is countercyclical but is constrained by its grounding in some form of PIH. A key element of this analysis is that the ability of monetary policy to adequately smooth welfare for households in the economy is limited when many households are liquidity constrained (i.e. their incomes are low enough that they live paycheck to paycheck). In effect, the government can improve welfare by saving on their behalf out of mineral income and spending or transferring the money in cyclical downturns. In theory the best way to accomplish this is via direct transfers and taxes on labor and consumption.

The case for strong countercyclical fiscal policy rests on the targeting of the incomes of lower income groups as the appropriate goal for policy. The welfare implications of doing this are clearly better than a balanced budget rule, which simply transfers current cyclical ups and downs to the government budget and hence to all who are affected by it. It is also better than structural surplus rules, which take a longer term view and which seek to target a desired long-run government surplus to GDP ratio and responds to cyclically low (high) government surpluses by increasing (reducing) government debt rather than instantaneously changing fiscal instruments. But this tends towards minimizing fiscal instrument volatility. A key insight of Kumhof and Laxton's paper is that, if minimizing business cycle volatility should instead be the

main objective, there are significant gains to adopting a much more countercyclical rule implemented via strong automatic stabilizers such as progressive taxation and unemployment insurance.

Kumhof and Laxton recommend a simple policy rule whereby the fiscal surplus to GDP ratio responds to a tax revenue gap and a raw materials revenue gap. The rule ensures debt sustainability in the long run and is highly effective at stabilizing the business cycle in the short run.

B. Economic Theory of Fiscal Rules Directly Applied to Kazakhstan

Engels and Montecinos (2013) explore the welfare effects of various fiscal rules in a non-Keynesian setting i.e. one in which there is full employment and multiplier effects are absent. The assumption that output is exogenous is appropriate to the Kazakh case in that both oil production and oil prices are determined by geology and the world economy – both factors that are beyond the control of policy makers or the influence of the local economy. What this means is that their analysis is aimed at evaluating fiscal rules in terms of their "insurance" effect – that is, their ability to compensate for consumption shortfalls rather than their ability to smooth output. They calibrate their model to approximate the actual structure of the Kazakh economy in terms of the relative size of the mineral sector and the heterogeneity of households in terms of income.

Engels and Montecinos then evaluate a three different fiscal rules: One is a "perfect world" case in which the fiscal rule is able to perfectly compensate for shortfalls in household consumption. While not particularly realistic, this case serves as a useful benchmark for the maximum welfare gain attainable via any kind of fiscal rule. The other two cases are more relevant to the current policy discussion in Kazakhstan – One is a rigid rule allowing for a fixed transfer, much like the rule that has been in place for several years, while the other is a rigid rule allowing for an escape clause in the event of a major decline in consumption below some fixed threshold value.

Interestingly, they find that the "fixed rule with escape clause" does a very good job of capturing most of the welfare gains attainable under a "perfect world" optimal policy. Indeed, fully 75% of the maximum can be achieved by this type of policy. Nevertheless, such a rule would still have the problem of defining what exactly the required threshold value should be, and also how to return to the original rule when the crisis is past.

Given these difficulties, their findings reinforce the idea of strengthening countercyclical "automatic stabilizers" by using transfers to households. These transfers, even if not perfectly targeted at lower income households, are capable of generating welfare effects that capture the majority of the gains potentially available under optimally chosen fiscal reactions in line with PIH considerations.

This result is important in that even if the scope for countercyclical policies on Keynesian grounds is limited due to the factors considered above, there is still good reason on welfare grounds for the government to institute (or strengthen) automatic programs targeted at lower income households. These programs could be triggered by direct reference to household incomes but could also rely on more aggregate level indicators given the high correlation of these with incomes at the lower end of the scale. It is also important to note that the better the targeting of these automatic stabilizers, the smaller the revenue transfer needs to be to achieve any given welfare goal.

C. The Role of the National Fund of the Republic of Kazakhstan

The establishment of the National Fund of the Republic of Kazakhstan (NFRK) in 2001 marks an important point in the evolution of Kazakh macroeconomic policy management. The NFRK serves multiple purposes which are well summarized in the World Bank's 2010a survey of country experience with sovereign wealth funds:

In commodity exporting economies, SWFs can help mitigate the destabilizing fiscal and macro-economic effects of large and volatile inflows of foreign exchange revenue. Because of volatility in global commodity prices, receipts (and by extension fiscal revenue generated by these exports) tend to fluctuate significantly even over relatively short periods of time. In particular when these revenues represent a large share of total export earning and/or fiscal revenue this will expose the economy and/or the budget to short term boom and bust cycles with undesirable consequences in terms of overheating during boom periods and costly adjustments to consumption levels during bust periods. Typically, stabilization funds are designed to accumulate funds when commodity prices are high (according to longer term price projections) and disburse when commodity prices are weak. As such, these funds are simply mechanisms that help to separate spending of resource revenues from the current revenue stream. By investing reserves abroad stabilization funds also help sterilize the domestic economy from the Dutch disease and related macro-economic consequences. In Kazakhstan the volatility of oil proceeds is abundantly obvious, making this feature of the role of the NFRK of prime importance.

1. *Beyond smoothening the effects of commodity price volatility, most SWFs in extractive economies also serve as vehicles for longer term fiscal savings.* The underlying idea of saving funds is very simple. An asset in the ground - oil, gas, or some mineral deposit- is replaced with a financial asset - thus maintaining national wealth. To this end, some or all revenues are deposited into the fund and invested in income generating assets, usually foreign securities. The motives for generating fiscal savings out of resource revenue vary:

• **To address issues of inter-temporal equity.** Since revenues from natural resources are generated through the depletion of an asset (the natural resource endowment) current consumption of all revenue would imply that only present generations benefit from the draw-down of non-renewable resource wealth. The creation of a permanent fund can help protect this wealth generating an infinite cash flow benefiting the present and all future generations.

• **To maintain fiscal sustainability in view of large, but transient revenue inflows.** The fiscal expansion financed by these inflows can often not be sustained once resources are exhausted, requiring

costly adjustments. By constraining fiscal expansion, for example by targeting annual budget revenues at no more than the net earnings provided by the resource wealth, a fiscal path is chosen that can be sustained beyond the extraction cycle.

• **To finance long term fiscal liabilities, for example pensions.** Some countries have linked the saving of resource revenues to long-term social liabilities, principally pension liabilities which have accrued or may accrue in the future. Although such funds may be supported by oil or other resource revenues, they are principally motivated by considerations of fiscal sustainability in view of long term spending pressures and the resource wealth merely serves as a funding source to meet these.[2] It is important to note, however that these funds do not necessarily imply permanent wealth protection, as the principal is not excluded from future withdrawals

• **To build up precautionary savings as a self-insurance against possible shocks, e.g. economic crisis.** Emerging markets are frequently exposed to significant macro-economic shocks (sharp negative fluctuations as opposed to small cyclical movements) and are more likely to face liquidity constraints making it more difficult to absorb shocks through some form of expansionary fiscal and/or monetary policy if they occur. Accumulating foreign reserves in the form of an SWF (or limiting the debt stock) during tranquil periods can reduce the welfare cost of adjustment in the event of a fiscal crisis. In effect, the precautionary savings motive broadens the stabilization objective to cover all kinds of fiscal contingencies, including but not limited to commodity price shocks. It may thus require reserve holdings exceeding what is needed for price stabilization.

• **Finally, SWFs serve financial objectives in terms of diversification of the asset base of the economy and achievement of higher risk-adjusted returns.**

All of the motivations above have obvious relevance to the Kazakh case. The NFRK together with other official international reserves totaled more than $73 billion at the end of 2011 (See World Bank 2012b) and the management of the oil fund is designed both to provide maximum benefit to the Kazakh economy on an ongoing basis and to prevent economic distortions in the short run. The global financial crisis of 2008-09 and the dislocations that stemmed from it inspired a reevaluation of the rules for spending money from the NFRK. The original rule, detailed in the notes to the description of the NFRK contained in the Appendix, amounts to a rule that is fixed in terms of the amount that is transferred to the annual budget. While this does help stabilize fiscal expenditures since it adds a large constant component to non-oil revenues which themselves fluctuate in a cyclical manner, it falls short of a fully countercyclical policy. In 2010 this rule was amended to better control off-budget uses of the fund and to modify limits to its use in light of the crisis. The current rules are:

- Fixed annual guaranteed transfer (made in monthly or quarterly installments) to the budget of US $8 billion starting in 2011.

- Minimum NFRK balance of 20 percent of projected GDP at end of the respective fiscal year (guaranteed annual transfer will be reduced in case expected balance falls short of this minimum requirement).

- Annual expenditures on service of public debt, however defined, not to exceed 4.5 percent of imputed fixed investment return on the fund. (It remains unstated when fund balance is measured, e.g., projected at the end of the respective fiscal year, average over some period, actual balance prior year.)

- Average cost of service and repayment of public debt over 10 year period not to exceed 15 percent of total budget receipts including cash transfer from the fund

- Target of 3 percent GDP non-oil deficit by 2020.

- No off budget financing, i.e., no guarantees or lending for domestic activity including Samruk-Kazyna and KazAgro.

World Bank 2010b suggests an alternative in view of the fact that stabilizing oil revenue but leaving the remainder of the budget to fluctuate according to current conditions could well result in an overall procycality of fiscal policy. Instead, it is proposed that the Fund operate in a manner explicitly designed to offset the cyclicality of non-oil revenues. The structural non-oil deficit would be the target variable and would be limited to the expected annuity generated by oil wealth, whether still in the ground or in the NFRK. This estimated structural deficit is a key variable and must of necessity be estimated independently of political considerations. Properly done, this concept would result in a truly countercyclical fiscal policy. World Bank 2010b provides the following summary comparison of the current rule and the proposed rule

Current Fiscal Rule

Structural Rule:

NFRK Transfer = US$ 8 billion
Actuals:
Expenditure = Non Oil Revenue + NFRK Transfer (+ Debt Financing*)

NFRK Saving = NFRK Revenue – NFRK Transfer

Net Saving = NFRK Saving (– Debt Financing*)

Alternative Fiscal Rule
Structural Rules:

Structural Balance Target = Imputed Real Return x (Fund Balance + NPV(Expected NFRK Revenue))

Structural Expenditure = Structural Non Oil Revenue + Structural Balance Target

Actuals:

NFRK Transfer = Structural Expenditure - Actual Non Oil Revenue (-Debt Financing*)

NFRK Saving = NFRK Revenue - NFRK Transfer

Net Saving = NFRK Saving (-Debt Financing)

World Bank 2012a proposes a multi-layered rule in which various goals of the NFRK are addressed by independent parts of an overall fiscal rule architecture. The long run permanent income from the fund would be addressed by the current fixed (in constant dollars) transfer from the fund to the fiscal budget. In order to relate the use of oil wealth to the overall net wealth position of the country (i.e. in order to include debt as well as savings in the calculation) there

would be an additional constraint limiting the amount of the annual deficit that could be financed with debt issuance. A final component would be a structural fiscal balance target a la Chile or Norway.

In order to simplify the execution and ensure transparency, it is proposed that this component would take advantage of the high correlation of Kazakh economic fluctuations with world oil prices. Accordingly, this component would be tied to variations of the world oil price around its long run equilibrium. Of course, as noted below, the biggest stumbling block to this approach is defining what the long run equilibrium price of oil actually is, as well as just how long the "long run" is assumed to be.

Given this rule's explicit differentiation between three different motivations for management and control of flows from the oil fund (the Permanent Income approach which yields a constant flow, debt sustainability which yields a flow linked to the sustainable state deficit, and stabilization which is linked to the oil price) it is a useful framework to guide analysis of alternative rules. The various competing candidates can be viewed as special cases under this framework and varying combinations of them can be analyzed to see how they interact with each other under different economic circumstances.

Finally, it is worth noting a recent proposal to diversify investments of the NFRK to include domestic as well as international assets. While there are no doubt cases where this might be a good idea, the possible problems with this should be emphasized. One of the most important functions of the NFRK is to insulate the domestic economy from distortions caused by large flows of mineral income – and it does this precisely by investing in offshore assets so that expenditures in the domestic economy that could be excessive or volatile are filtered through a fiscal mechanism where control can be exercised. Moves away from this ability to control potential stimuli should not be incorporated without thinking through the ramifications. These are not purely economic – the politics surrounding domestic investments would in many ways mirror those related to investment banks in the many countries where they have been instituted. A careful reading of this sometimes less than exemplary history would be informative.

III. Issues in the Implementation of Countercyclical Policy in Kazakhstan

A. A Caveat – Spending Volatility and Real Exchange Rate Volatility

A major concern in any recommendation for Kazakh fiscal management must take into account the potential real exchange rate effects of what is proposed. These concerns relate not only to problems of sustained appreciation of the real exchange rate leading to undesired long term structural changes in the economy (via traditional Dutch Disease mechanisms) but also to problems of volatility in the real exchange rate leading to increased risk and unreliable market signals to producers and investors, as discussed in Hausmann (2005) and Hausmann & Rigobon (2003).

Indeed, proponents of using fiscal policy in a countercyclical manner advocate using the real exchange rate as the target variable of interest, but it is important not to end up creating fiscal expenditure and tax volatility in response that is disruptive in its own right. That is, to the extent that a simple rule can pave the way for fiscal policy to smooth the variations in real exchange rate there can be benefits for the non-mineral traded sector and for the economy as a whole. But fiscal signals are themselves important to such producers and it is important not to sacrifice too much stability and predictability in these signals.

B. Multipliers

First, some considerations as to what makes a fiscal multiplier higher or lower are in order. Generally speaking, we are looking for two characteristics: First, when looking for a large multiplier we want a spending target which will elicit and output and employment response on the part of the real economy rather than simply bidding up prices. This implies that we want to spend money in areas where there is either excess capacity or in which additional capacity can be added with relative ease. Second, we want the subsequent rounds of effects to be concentrated in the domestic economy (again in areas with relatively elastic supply response) rather than being dissipated through leakage out of the domestic economy into increased imports.

In addition to the above considerations we also need to bear in mind that expenditures which can increase supply response elasticity are also to be favored though here the likelihood that such expenditures can be easily increased or decreased through the business cycle is less. This is due to the fact that infrastructure or other capital projects are less divisible than are other types of expenditures and so are less amenable to being used as countercyclical instruments of policy.

To definitively quantify expenditure and tax multipliers it would be necessary to estimate a full fledged macroeconomic model which is beyond the scope of this paper. Lacking that, a review of Kazakh public expenditures and taxes together with some idea of the import component of spending in different areas can get us a long way toward a classification of expenditures for the purpose of defining those with high vs. those with low multipliers.

The most recent quantitative analysis of some of the relevant parameters can be found in Naumov (2009) which constructs a Social Accounting Matrix and CGE model of Kazakhstan for the purpose of evaluating the impact of oil revenue as well as Hare and Naumov 2008, which reports some of the findings of the more extensive 2009 study. Based on Kazakh household and budget surveys from 2002- 2005, this study reports both expenditure patterns of households and the import content of overall sales for different sectors in the economy.

The sectoral composition of government spending is the most important consideration in terms of the impact effect on the domestic economy, but the import content of domestic sales in those sectors determines the extent to which subsequent rounds of effects are contained within the country or are leaked out via import expenditures. Household expenditure structure is also a key element of the extent to which expenditure effects are contained or leaked out, since payments to labor (and therefore household income) play a large role in determining where

secondary effects are felt. For example, if the government were to spend heavily on construction projects in order to increase future productivity, we know that a large share of the payments to the construction sector ends up in the hands of workers, given the relatively high labor content of production in this area. The expenditure patterns of these workers determine, in turn, whether the domestic economy will get a boost (if they spend in areas dominated by domestic production) or if the effects will be felt only in increased imports (if they spend on imported items like cars).

Table 5 is taken from this study and show that household consumption is heavily weighted toward food and drink (almost 40%) with large shares also going to apparel and home furnishings (9.7 and 5.4%) . Utilities including electricity gas and water account for 6.8% while transport and education and agricultural goods are also important at 3.7, 3.5 and 3.4%. The approximately one third of expenditures remaining is split among a variety of categories.

Table 6 shows that food and fuels have a high import content in terms of domestic market share, as do manufactures of all kinds. Other sectors have a far lower import share in domestic sales indicating that purchases directed toward these sectors will boost domestic demand more in terms of direct effects than will other purchases. It is important to note that some sectors appear to have a fairly high domestic content in terms of direct expenditures but would almost certainly reveal a high import content in their own input structure if a more detailed analysis were done. Transport is a good example of this, where virtually all transport services are supplied by domestic providers but these in turn purchase most of their vehicles and the inputs to run them from outside of the country.

There is an important caveat to this entire discussion. Typically, discussions of multipliers revolve around finding spending targets which will *maximize* the extent to which domestic demand will be boosted. However, in an oil economy susceptible to overheating from excessive spending of oil revenue there is a definite limit to the extent to which the government will want to see domestic spending increase in any given period. It is entirely possible that that spending on e.g. construction, which shows a 25% imported content in final sales would be an important area for spending given the long run priorities of the government.

C. Monetary Policy – The need for Financial Development

As noted above, one of the key requirements for enabling an effective countercyclical monetary policy is a deepening of the financial sector in terms of types of instruments available, having a sufficient supply on the market so that liquidity can be assured when monetary policy requires their use as an instrument, and a deep enough financial development so that the linkages between financial markets and instruments on the one hand, and the real economy on the other are well enough developed that monetary policy can hope to affect outcomes on the real side.

Earlier studies of the Kazakh economy (See for example Deep 2005) discussed the need for financial deepening and development. Kazakhstan stood out at that time as a country that had done very well in terms of financial development given the relatively recent transformation from the former Soviet system. However, the world financial crisis of 2008-2009 resulted in

many local banks being taken over by the state, and credit growth to the private sector has been "anemic" in the words of one analyst since that time.

This is important since it is precisely through such channels that monetary policy must act if it is to be an effective instrument of policy in affecting cycles in the real economy. The fewer the options for private sector entrepreneurs to access credit or financial markets, the fewer are the channels through which economic authorities can expect money and interest rates to provide a stimulus or to slow them down.

A major impediment to achieving a broadly effective monetary policy in Kazakhstan at the present time is the fragile state of the banking system after the world financial crisis of 2008-2009 and the subsequent end of the Kazakh real estate bubble that accompanied the world wide boom before the crash. As noted above, many banks got into major financial trouble as a result of the crisis and many were taken over by the state. A pervasive problem for the system as a whole is the high proportion of Non Performing Loans carried by banks at the present time. While it is clearly not the role of this report to analyze or solve this issue, it is worth noting that until it is dealt with, any effort toward financial broadening or deepening will be limited.

Table 5 Structure of expenditure of the representative household - 2005

Agriculture and related services	3.4%
Coal, other solid fuels	1.7%
Food and Drink, Tobacco	39.8%
Clothes and Shoes	9.7%
Furniture, Textiles, Cleaning & Home products	5.4%
Personal goods, tv, computers, etc.	1.9%
Books, newspapers, magazines	0.7%
Cars and other transport equipment	1.2%
Gasoline and fuels	1.3%
Other personal usage goods	3.5%
Electricity, gas, heat and water, central heating	6.0%
Construction and housing repair	1.3%
Car repair and maintenance	0.3%
Repair of personal goods services	0.3%
Hotels and Restaurants	2.2%
Transport	3.7%
Post, Internet, Telecommunications	2.7%
Financial & legal services, incl. rent & insurance	0.4%
Personal services	1.5%
Education	3.5%
Health and medical services	2.4%
Public utilities - sewage, water disposal, etc.	0.8%
Amusement and recreational services	0.7%
Other (pets, plants, related services	0.5%
Inter-household transfers	5.2%
Tax on land and real estate	0.1%

Source: Hare and Naumov 2008

Table 6 Imports and Domestic Sales in 2002 (millions KZT)

	Total Output	Exports	Imports	Exports/Output	Imports/Sales
1. Agriculture	3800	1110	100	29%	4%
2. Forestry	50	2	5	4%	9%
3. Fishery	170	0	1	0%	0%
4. Coal, lignite and peat	1030	350	9	34%	1%
5. Crude oil extraction	10560	7580	600	72%	20%
6. Other mining	2350	160	100	7%	5%
7. Food, close, tobacco	7860	260	6520	3%	86%
8. Fuels and chemicals	2510	750	1840	30%	105%
9. Metals & metal products	7100	4410	1190	62%	44%
10. Other manufacturing	1080	290	3700	27%	468%
11. Electricity, gas & water	3490	7	50	0%	1%
12. Construction	4840	1	1230	0%	25%
13. Trade	8200	2310	1	28%	0%
14. Hotels and restaurants	690	0	0	0%	0%
15. Transport	6740	30	750	0%	11%
16. Post and communication	1080	90	80	8%	8%
17. Financial services	7680	150	1260	2%	17%
18. Public and other services	6200	340	50	5%	1%
Total	**75430**	**17840**	**17486**	**24%**	**30%**

Source: Naumov 2009

IV. Problems of Forecasting

One major unknown in any countercyclical policy is the extent to which cycles may indeed be cycles or whether the observed movements are permanent changes which cannot be expected to be reversed. Certainly, Figure 1 demonstrates a volatility in world oil markets that has become increasingly marked in recent years. But how long would a cycle have to be before Kazakh authorities should start to regard the changes as permanent rather than merely temporary? And could such a cycle be accurately identified in time for appropriate policies to be implemented in a timely fashion?

This dilemma is particularly relevant to world oil markets given the many competing forces acting on them. The increasingly tight world supply/demand situation, due to industrialization and growth in large economies such as China and India gives reason to suppose long term trends in oil prices might be toward the up side. But to regard any particular upswing shown in Figure 1 as part of this permanent trend rather than as a temporary phenomenon could well have caused trouble over the period of the last 8-10 years. Equally, it is entirely possible that Europe and the USA could enter a prolonged period of low growth over the next decade, causing world oil prices to stagnate. This uncertainty dictates that any policy or rule be conservative and that there be provision for phasing out if putative cycles end up turning into trends. Unfortunately, the evidence at hand indicates that the economics profession is quite bad at estimating business cycle conditions in real time (and therefore bad at estimating structural deficit gaps) and equally bad at predicting oil price behavior (the main underlying causal factor in Kazakh economic cycles).

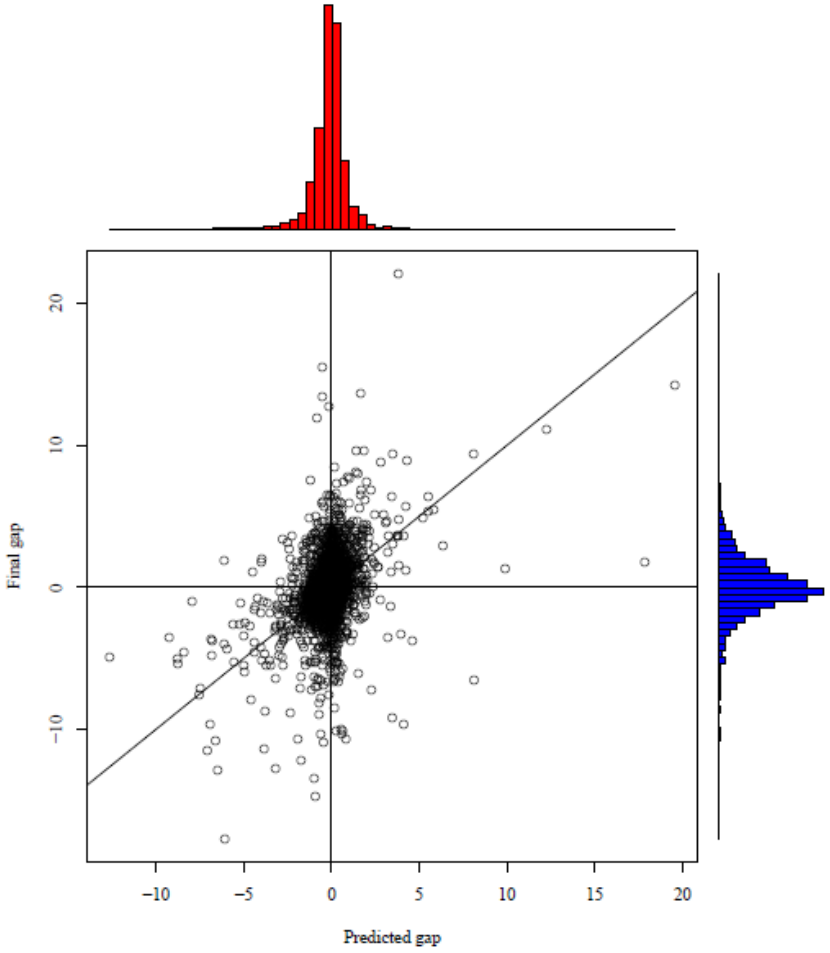
The Near Impossibility of Reliably Estimating Business Cycle Conditions in Real Time

Onder and Ley (2012) provide an excellent example of the difficulty inherent in estimating business cycle conditions in a manner that is timely enough for policy to be implemented in anything like an optimal manner. They demonstrate that assessing the cyclical position of the non-mineral economy is a very challenging task by contrasting best-practice predictions of output growth in a cross section of countries with the final data for the output gap and growth projections. They use IMF data, which covers over two decades. For each year, the predictions correspond to the projections in the previous year's Fall IMF-World Economic Outlook. These get subsequently revised and the final numbers correspond to the most recent vintage in the data set (Spring, 2011 WEO).

Onder and Ley start by comparing the output gap estimated in the previous Fall WEO with the one computed using the final data that are available. Figure 2 shows the scatter plot of predicted output gaps versus the final estimates of the same output gaps. If predictions were reasonably good, we should see the scatter plot lie along the diagonal, however, as we see in Figure 2, the dispersion is very large. The correlation between final and predicted gaps is below 0.4. Not only that, but the presence of a large number of observations in the upper left and lower right quadrants shows that there are many cases where even the ***sign*** of the prediction was wrong, forecasting positive growth when in fact it turned out to be negative, or vice versa. In

fact, the predicted output gap incorrectly predicted the direction of growth in almost 40% of the cases.

Figure 2: Predicted Output Gap vs. Final Output Gap (175 countries, 1990-2011)



These results indicate that trying to use a forecast structural deficit balance as the target for a cyclically-adjusted fiscal policy provides a very uncertain anchor for the public finances. While it has a conceptual appeal, in practice it cannot be done with the level of precision needed. In practice it seems that the observation of Martin Wolf in the *Financial Times* (March 6, 2012) is appropriate:

> "It does make economic sense to target cyclically adjusted rather than actual deficits. But the improvement in economics is at the cost of a reduction in precision. Nobody knows what a structural deficit is."

Onder and Ley continue their analysis by looking at predictions for Kazakhstan in particular, since these are included in the IMF-WEO database. The WEO predictions are the

result of a comprehensive and systematic procedure. The IMF country desks, in consultation with country governments and other observers, submit their forecasts to the WEO division. The WEO division makes sure that 'the pieces fit in', checking the compatibility of the forecasts between countries that have significant trade, or share significant trade partners. Several iterations with individual desks may occur before it is settled in the published WEO (Winter and Summer rounds are published in the Spring and Fall WEOs).

The data make clear that Kazakhstan is no exception, to the results found in the cross section above and it is rather difficult to predict its GDP growth. While absolute growth rates average about 7 percent, the Mean Absolute Error amounts to about half of this average, from 4 to 3.5 percent when predictions are performed the previous year. Thus the uncertainty amounts to about half of the prediction.

The Near Impossibility of Reliably Estimating Future Oil Prices

Unfortunately, we are no better at forecasting oil prices than we are at forecasting deficit balances. Figures 3, 4 and 5 (taken from Austvik 2009) underscore the importance of recognizing our inability to forecast oil prices. Figure 2 shows the average (consensus) values of oil price forecasts made at different points in the 1980's for future price levels in the 1990's. Collected by the International Energy Workshop at Stanford from between 300 and 400 projections made by economists in various academic, research, and government positions the figure makes very clear that projections are typically just extrapolations of current conditions and have no real ability to predict true price paths, much less long term average values. It is interesting to note that virtually all forecasters saw a future of increasing oil prices regardless of the level they started at.

Forecasting ability was not improved in the following decade. Figure 3 shows much the same pattern of extrapolation of current events with a rising trend. Only when current conditions happen to mirror those a decade hence do forecasts even approach the future reality. Figure 4 shows forecasts over the past decade from the US Energy Information Agency. Though only one source, this example is representative of forecasts made by professional economists in recent years. Again, the pattern of extrapolating current conditions with a tendency to imagine future increases is evident.

These examples should not be taken as an indictment of the economics profession or of bias on the part of forecasters (at least not intentional bias). Rather, it shows that reliance on any projection of world oil prices must have a rather wide confidence interval given the abysmal record of such forecasts in the past. The recent extreme swings in oil prices seen in Figure 1 underscore the problems with excessive reliance on forecasts. The last 6 years have seen prices vary from the vicinity of $40 to around $140. It would take a brave economist to claim any degree of certainty about where they will be over the next 6 years.

Hevia 2012 provides support for a policy of caution with respect to oil price forecasts. He constructs a general equilibrium model calibrated to Kazakhstan's circumstances in which the government chooses a path of taxes, expenditures, and debt in order for the decentralized

equilibrium to replicate the optimal social planner's solution. He then simulates the behavior of several macroeconomic variables under different scenarios for oil reserves in Kazakhstan and future international oil prices.

Interestingly, he finds that the large size of Kazkhstan's oil wealth relative to the population tends to generate high-current-consumption solutions under a wide range of alternative settings for macroeconomic variables. But there is one caveat of particular importance in light of the above discussion of oil price projections. In Hevia's words:

> "But what if the optimistic (oil price) expectations are not realized? Then the economy would find itself under considerable stress, having saved too little, in fact sub-optimally given ex post information. Since the implications of excessive consumption and (public and external) debt are often macroeconomic crises with undeniably large costs, it would be advisable to err on the side of caution and work under the assumption of moderate expectations for oil reserves and future oil prices"

The message is clear – If a fiscal rule is adopted which conditions flows on oil price projections then a conservative approach to these projections is much preferred.

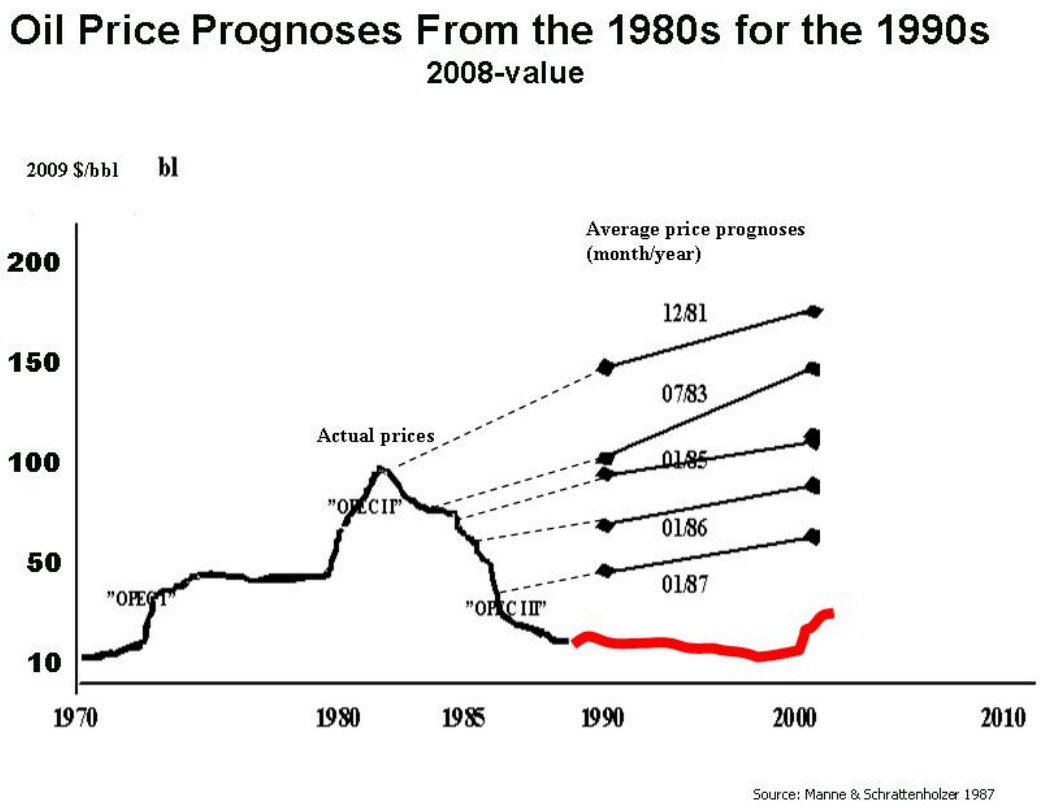

Oil Price Prognoses From the 1980s for the 1990s
2008-value
2009 $/bbl
bl
Average price prognoses
(month/year)
12/81
07/83
01/85
01/86
01/87
Actual prices
"OPEC I"
"OPEC II"
"OPEC III"
200
150
100
50
10
1970
1980
1985
1990
2000
2010
Source: Manne & Schrattenholzer 1987

Figure 3

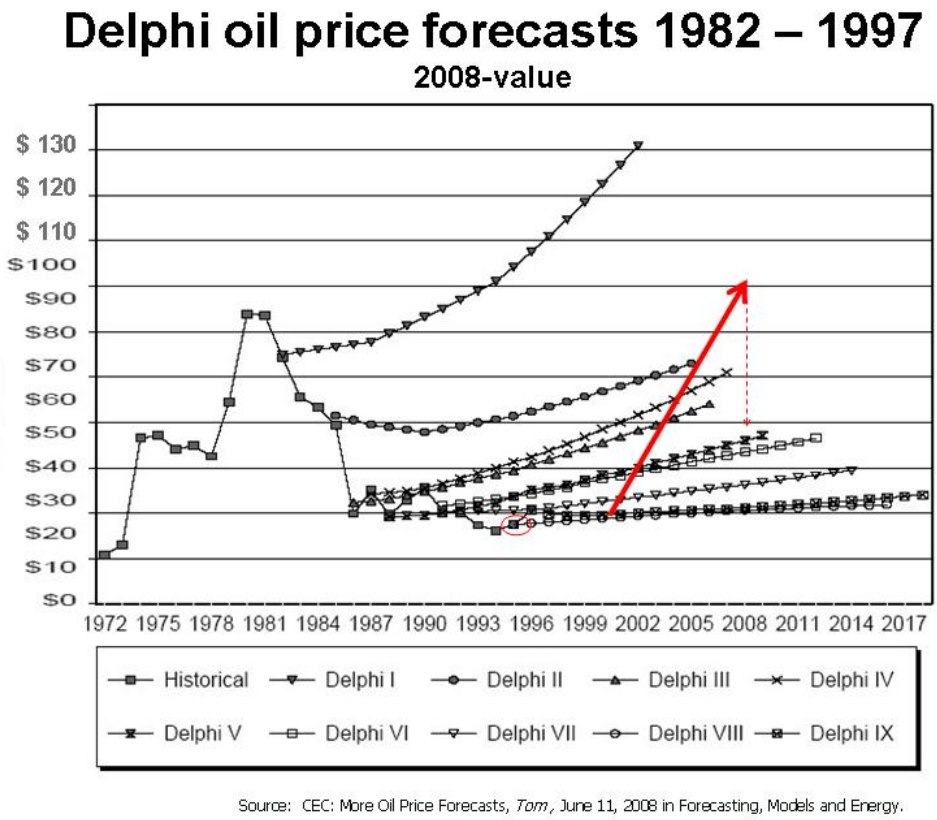

Delphi oil price forecasts 1982 – 1997
2008-value
$ 130
$ 120
$ 110
$100
$90
$80
$70
$60
$50
$40
$30
$20
$10
$0
1972 1975 1978 1981 1984 1987 1990 1993 1996 1999 2002 2005 2008 2011 2014 2017
Historical
Delphi I
Delphi II
Delphi III
Delphi IV
Delphi V
Delphi VI
Delphi VII
Delphi VIII
Delphi IX
Source: CEC: More Oil Price Forecasts, *Tom*, June 11, 2008 in Forecasting, Models and Energy.

Figure 4

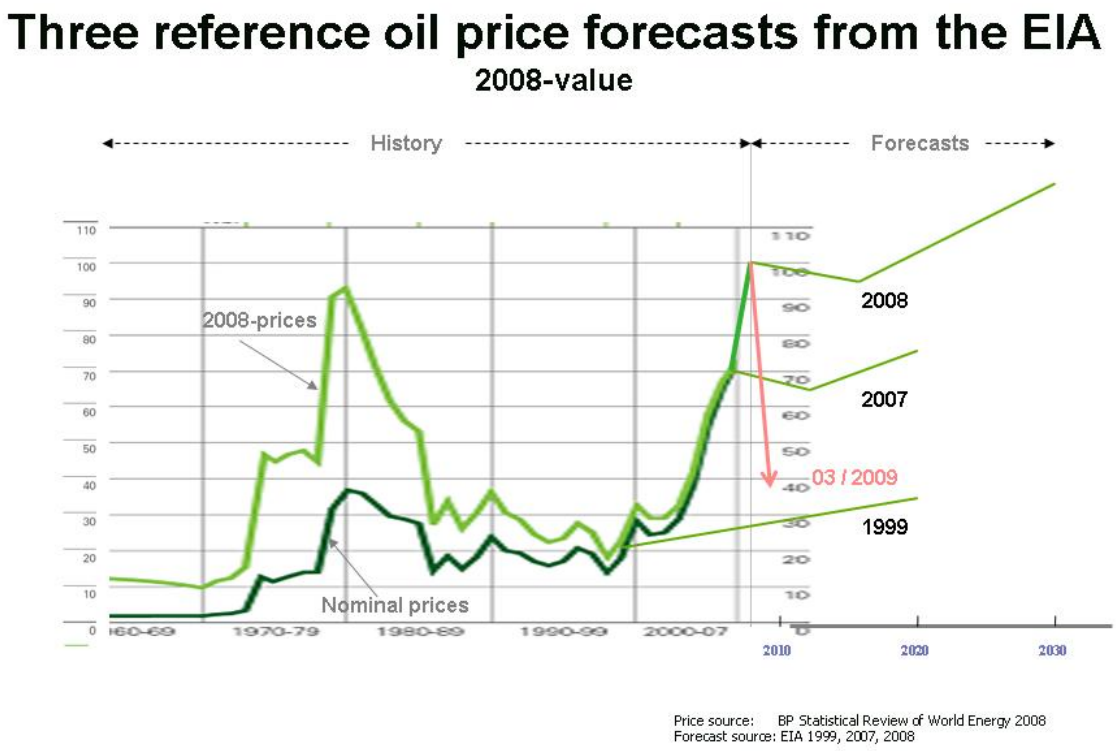

Three reference oil price forecasts from the EIA
2008-value
History
Forecasts
2008-prices
Nominal prices
2008
2007
03 / 2009
1999
1960-69
1970-79
1980-89
1990-99
2000-07
2010
2020
2030
Price source: BP Statistical Review of World Energy 2008
Forecast source: EIA 1999, 2007, 2008

Figure 5

V. Current Practice in Other Resource Exporting Countries

In discussing the possibilities for modification of Kazakhstan's current rule for transfers from the NRFK to the national budget it is useful to look at the experience of other resource rich developing countries and draw some comparisons. Baunsgaard et. al. (2012) contains a summary of the current state of the debate along with a description of current practice in a selection of resource rich countries (See Appendix Tables from Baunsgaard et. al. reproduced below).

The paper also surveys the advice given to each of these countries and highlights the somewhat surprising result that PIH based rules have played a lesser role in practice than might have been expected given the importance of preservation of wealth for future generations in much of the discussion in academic and policy circles. Rules based on this goal have accordingly been much analyzed but were implemented in only six of seventeen countries (developed and developing) surveyed, though they were discussed in two others.

Dissatisfaction with PIH based rules has arisen in some quarters based on the desire of governments to increase capital formation in capital poor countries. Accordingly, efforts to define alternatives which would allow increased investment in current periods have been investigated, though in most countries there remain limits (at least in theory) on the amounts that can be transferred, primarily in order to prevent economic management problems in terms of overheating the economy, real exchange rate appreciation, etc.

For our purposes here, the key table in Baunsgaard et. al.'s survey is that contained in Appendix III of that paper and reproduced below. The table surveys 11 resource rich countries contained in Baunsgaard et. al. and specifies the type of rule followed and also the rules regarding transfers from the sovereign wealth fund to the national budget. Of these 11 only four have PIH based rules and of these only Norway has adhered strictly to its rule as written while Azerbaijan, Russia and Timor-Leste have all either suspended their rules or simply exceeded the amounts indicated in practice.

Of the countries with a resource fund, only three (Costa Rica, Norway and Timor-Leste) have a flexible rule based on the structural fiscal balance. The remainder have some form of revenue sharing or threshold value rule which does not depend on estimates of the fiscal situation or the business cycle. Even these have not been honored in all cases. While Baunsgaard et. al. do not survey the macroeconomic outcomes generated by this fact, the long literature on Dutch Disease and related issues points to potential problems that can result. To the extent that volatility in transfers as well as real exchange rate appreciation can be avoided there is a case to be made for bringing investment expenditures forward in time to allow capital formation to benefit current generations as well as future ones.

Kopits 2004 contains a collection of papers from which a variety of "lessons learned" from the experience of other countries are collected in the concluding chapter. These are:

- Fiscal rules need support of the electorate. In the Kazakh case it is hard to judge the extent to which the public understands the nuances of fiscal rules or resource management, but support of the legislature is important in legitimizing the decisions made.

- It is best to have rules written into the constitution but even informal rules can work if they are generally accepted. Here the Kazakh case presents a "best case" example but also some retreat from this in the last year. While the original fixed rule was written into law and well understood, the subsequent loosening of the rule to allow 15% deviation was done via a less formal process. Regularizing whatever is adopted next will be important.

- A fiscal rule only works if there have good procedural rules (accountability and transparency) – Here the Kazakh case is exemplary in that there is one sole recipient of oil funds – the NFRK – and the amounts to be transferred are clearly seen by all.

- Emerging markets have lower tolerance for high debt/GDP ratios than do developed countries. This is an important consideration for the future and the Kazakh authorities have clearly focused on this in their rules regarding the limits on debt issuance by the government.

- There is more volatility in emerging markets and this needs to be taken into account. Indeed, this is the rationale for the current exercise and this paper.

- Commodity stabilization funds are good for resource economies where resource is non-renewable. The Kazakh use of the NFRK is exemplary in this regard.

- Fiscal decentralization needs careful attention to rules. The Kazakh case is not highly decentralized at the present time, making this consideration somewhat less directly relevant.

Overall it seems clear that the Kazakh performance to date has been among the best to be found among resource exporters. Accordingly the need for careful consideration of any proposed changes is obvious.

VI. Numerical Simulation of Alternative Fiscal Rules in the Kazakh Case

Though earlier sections of this paper cast some doubt on the reliability of economic forecasts, it is nevertheless instructive to go through a forecasting exercise in the Kazakh case in order to both set the bounds for what may be expected in the future, and also to ensure the coherence of various assumptions about the future. That is, we need to know that we are not making mutually exclusive assumptions for different parts of the world and national economies. The next sections provides some details based on projections made specifically for this study by the World Bank's DECPG unit (World Bank 2013).

A. Baseline Scenario

The overall context for the projections is important since relations with the rest of the world so strongly influence Kazakhstan's export earnings and domestic economic conditions. Overall, DECPG assumes that the real price of oil will stabilize in the long run as the current massive increases in demand from major consumers like India and China themselves stabilize as those countries attain a higher level of per capita income. Nevertheless, developing countries will constitute an increasing share of the world oil market as time goes on.

In the domestic economy, Total Factor Productivity is assumed to grow steadily at 2.5% p.a. This is an optimistic assumption compared to the past, but not out of line with what might be reasonably expected in a post Soviet environment where investment can be expected to be more productive than it was during the immediate pre- and post- liberalization years. Nevertheless, it is important to note that this assumption implies that investment will continue at a high rate and will be capable of generating substantial growth in the non-oil economy.

Figure 6: Real price to stabilize in the long run

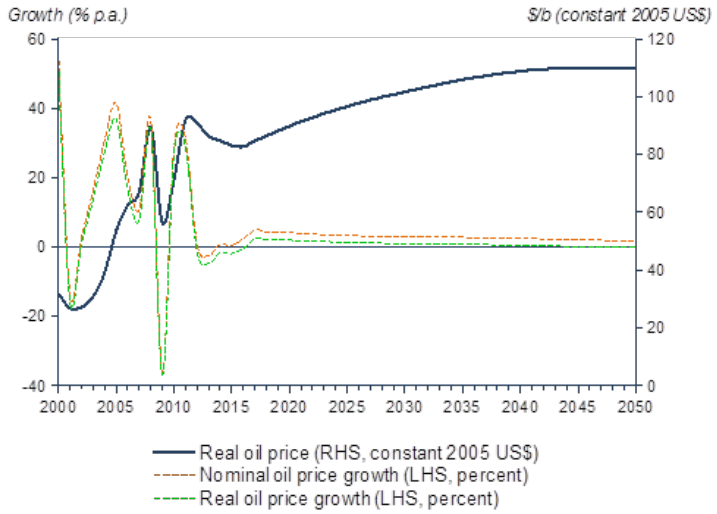
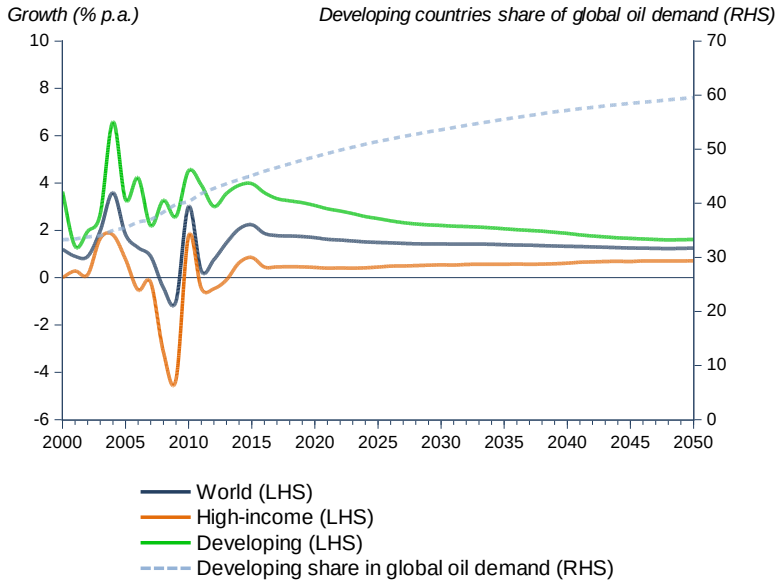
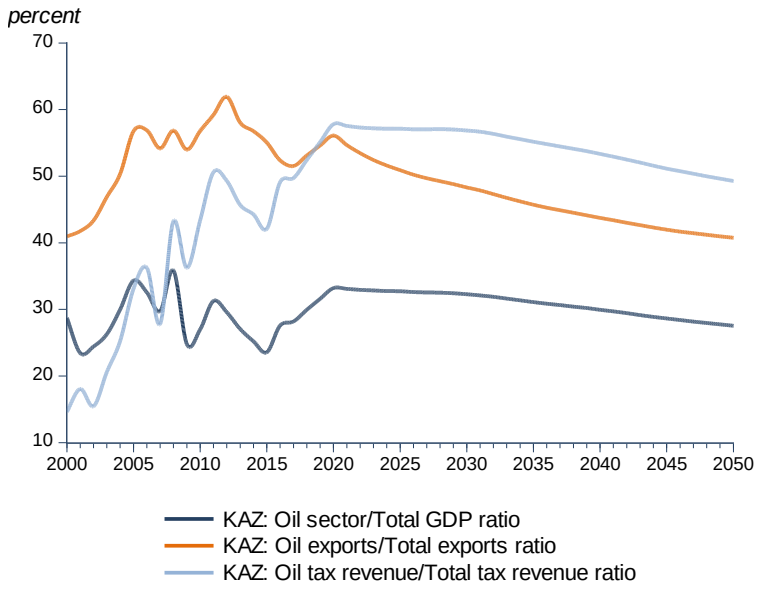


Figure 7: Strongest growth in oil demand to come from developing countries



Overall, these are relatively optimistic assumptions as far as Kazakhstan is concerned. With rising and then stabilizing world oil prices, the implication is that the oil sector can be relied on for decades to come as a reliable source of revenue for the country. Accordingly, Kazakhstan is projected to see some moderation of growth in the future but with a continued heavy reliance on oil. Currently (2013 estimates), Kazakh oil production represents about 27.1 percent of GDP, and non-oil production 72.9 percent. Between now and 2020, Kazakh oil-production is expected to rise by 6.8 percent per annum based (% p.a.) on numbers from the World Bank's country team, while the modeling here assumes that the pace of oil supply growth eases to 3% p.a. thereafter. The remainder of the economy is projected to grow by 4.4% p.a. Over time, with real oil prices expected to be broadly stable, oil's share in the real economy is forecast to decline gradually from 25.4 (2013) to 21.3 percent (2050).

Figure 8: Baseline forecast suggests continued (albeit declining) reliance on oil sector



Achievement of this relatively optimistic baseline forecast is not guaranteed, and its success is predicated on:

- Continued strong technological progress (TFP) growth at a 2.5% p.a. growth rate over 2013 – 2019, then slowly tapering off to 2% growth from 2025 onwards. This will require a continued process of improving policies and creating a business friendly environment. This TFP assumption is fairly optimistic. At 2% to 2.5%, TFP growth is on par with the average for developing countries, but well above the 1.6% p.a. average growth for developing countries when China is excluded and is higher than the average in all developing regions except EAP and ECA.

  Nonetheless, there could be substantial benefits to the Kazakhstan economy if TFP growth were to be just 0.5% p.a. faster in Kazakhstan (see below an alternative scenario where TFP growth is assumed to be 0.5 percentage points faster than in the baseline).

- The UN‘s population and labor force growth rates – which suggests that the 15-64 cohort of the population will grow by 0.9% p.a. over the baseline forecast.

- Capital stock expands by 4.2% per annum, in turn requiring real growth of some 4.7% p.a. in real fixed investment over the forecast period, substantially below the 12.5% p.a. achieved over the ten years period ending in 2011.

Based on the above baseline forecasts, Kazakhstan's real GDP per capita is forecast to increase from $12,474 in 2013 to $23,308 by 2023, reaching $104,802 by 2050. [2] Currently (2013) Kazakhstan's GDP per capita equates to about 30% of the per capita income in high-income countries, but this is forecast to rise to 41.3% in 2025 and to 70% of high-income per capita GDP by 2050. When expressed as a share of the per capita income in 2012 in high-income countries, it rises to 46.5% by 2023 and to almost 83.8% by 2030.

To summarize: The baseline is predicated on continued relatively strong growth. Even though most of the growth will be from the non-oil sector, the oil sector will continue to play a major role in economic activity and exports and as a source of tax revenues. In fact by 2050, oil's share in nominal GDP would have declined by only 4.4% (i.e. from 25.4% in 2013 to 21.0% of GDP), while the tax ratio would be off the highs of 58% in 2020 but at 49.5% in 2050, it will still be higher than it is currently (45.9%).

This result derives from two important assumptions; 1) continued strong productivity growth; and 2) continued strong oil-sector output growth. Maintaining a budget surplus of about 1.5% of GDP over the long term, would thus allow total government expenditure to rise by 13.5% to 14.5% p.a. (or between 4.5% and 6% p.a. in real terms). The direct (i.e. ignoring second round multipliers) contribution of government outlays to GDP growth is estimated at more than 20% (or almost 1 full percentage point of the 4.2% average growth expected over 2013 – 2050). This continued heavy reliance on oil not only makes the country vulnerable to adverse developments in the oil market, but also over time increases the local economy's dependence on government – ultimately not sustainable over the long run.

B. Three Plausible Negative Shocks

Given the relatively optimistic nature of the above baseline scenario the question naturally arises as to the potential for negative shocks outside of Kazakhstan to affect the country's growth and equilibrium. While there are of course a multitude of such potential shocks, three were chosen to illustrate the possibility for external events to seriously affect Kazakhstan's economic situation: A serious Euro area crisis resulting from a financial sector breakdown; A US centered shock stemming from fiscal paralysis in the US government; A China centered shock stemming from a collapse of Chinese investment and therefore demand for Kazakh exports.

[2] Unless otherwise indicated, per capita income is based on nominal GDP per capita (weighted according to the Atlas methodology)

i. Impact of a deterioration of conditions in the Euro Area

Measures taken over the past several years, including by the ECB, have helped restore confidence in the Euro Area and reduce the likelihood of a serious deterioration of conditions. However, as illustrated by the uncertainties generated by the recent Cypriot bank bailout, a significant deterioration of conditions remains a possibility. Table 7 reports the results of simulations of a major Euro Area crisis.

The Euro Area scenario illustrates the impacts on global growth of a deterioration of conditions that causes two smaller Euro Area economies to be frozen out of international capital markets, in turn forcing a sharp decline in government expenditure and business investment spending (equal to around 9 percent of the GDP of each country). In the simulation the shock is assumed to be spread over two years, with 3/4 of it felt in 2013 and 1/4 in 2014. The impacts for developing countries in this scenario are much less severe than those presented in World Bank, 2012b), both because fewer economies are assumed to be directly involved and because confidence effects in the rest of the world are assumed to be less severe (partly reflecting the smaller size of the overall crisis). Nevertheless, growth in developing countries is reduced by 1.1 percentage points on average in 2013. As economies gradually recover the overall impact declines — but developing-country GDP would still be 0.3 percent lower than in the baseline even two years after the simulated crisis begins. Important transmission mechanisms and some of the vulnerabilities of developing countries in this scenario include:

- *Remittances* to developing countries could decline by 1.7 percent or more, representing as much as 1.4 percent of GDP among countries heavily dependent on remittances.

- *Tourism*, especially from high-income Europe, would be reduced with significant implications for countries in North Africa and the Caribbean.

- *Short-term debt*: Many developing countries have reduced short-term debt exposures in part because of Euro Area deleveraging. Nevertheless, countries that still have high levels of debt could be forced to cut into government and private spending if financial flows to riskier borrowers become more scarce in such a scenario.

- *Commodity prices*: The weakening of global growth in the Euro Area scenario causes a 7.5 percent decline in oil prices and a 7.4 percent decline in metal prices. Such declines are likely to cut into government revenues and incomes in oil and metal exporters, but helping to cushion the blow among oil importing economies.

- *Banking-sector deleveraging*: A crisis scenario could accelerate the process of bank deleveraging in Europe, with economies in Europe and Central Asia most likely (among developing countries) to be affected.

In this scenario, the simulations suggest Kazakhstan's GDP in 2013 (2014) would decline by 2.5% (1.6%) – relative to baseline, with its current account and fiscal balances deteriorating by 1.5% (0%) and 1.4 (1.1%) percent (Table 4). Real activity in Kazakhstan is principally impacted by "confidence" impacts, as domestic households cut back on expenditure, while business responds by delaying investment. Nearly 75% of the 2.5% decline in real GDP in 2013 (i.e. 1.9 percentage points) relates to the decline in confidence.

With global activity and import demand declining, Kazakhstan's exports also come under pressure, with trade contribution about 0.3 pp. to the overall decline in GDP. Lower global growth also reduces the demand for commodities, which exerts downward pressure on commodity prices, which in turn also reduces Kazakhstan growth by 0.3 pp. in 2013 and 0.2 pp. in 2014. In terms of the current account impact, the commodity price impact dominates, while the deteriorating fiscal balance is almost equally caused by falling commodity prices and the domestic confidence impacts.

Table 7: Impact of Euro area crisis

Euro crisis						
	Real GDP		Current account balance		Fiscal balance	
	2013	2014	2013	2014	2013	2014
	(%change in level)		(change, in % of GDP)			
Euro Area	-2.3	-1.4	1.3	0.4	-1.0	-0.8
World	**-1.3**	**-0.8**	**0.0**	**0.0**	**-0.7**	**-0.5**
High-income countries	-1.4	-0.9	0.1	0.0	-0.8	-0.6
U.S	-1.0	-0.6	0.0	0.0	-0.6	-0.4
Developing countries	-1.1	-0.7	-0.2	0.0	-0.5	-0.3
Low-income countries	-0.6	-0.4	-0.2	-0.1	-0.1	-0.1
Middle-income countries	-1.1	-0.7	-0.2	0.0	-0.5	-0.3
Developing oil exporters	-1.3	-0.9	-0.9	-0.2	-1.0	-0.7
Developing oil importers	-0.9	-0.6	0.2	0.1	-0.2	-0.2
East Asia & Pacific	-1.0	-0.7	0.2	0.1	-0.1	-0.1
Europe & Central Asia	-1.3	-0.9	-1.0	-0.3	-1.1	-0.8
Latin America & Caribbean	-1.2	-0.8	-0.2	0.0	-0.7	-0.4
Middle East & N. Africa	-1.0	-0.7	-0.9	-0.3	-1.4	-0.9
South Asia	-0.5	-0.3	0.5	0.1	0.0	0.0
Sub-Saharan Africa	-1.0	-0.7	-1.2	-0.4	-0.8	-0.6
Kazakhstan	*-2.5*	*-1.6*	*-1.5*	*0.0*	*-1.4*	*-1.1*
of which:						
commodity effect	*-0.3*	*-0.3*	*-1.6*	*-0.3*	*-0.7*	*-0.3*
confidence effect	*-1.9*	*-1.1*	*0.1*	*0.3*	*-0.6*	*-0.7*
slowdown in PRT and ESP	*-0.3*	*-0.2*	*-0.1*	*0.0*	*-0.1*	*-0.1*

ii. Impact of continued fiscal uncertainty in the USA

Although the January 1, 2013 fiscal deal resolved most of the tax-side (the larger portion) of the fiscal cliff, the spending portion of the fiscal cliff was not resolved at that time. The sequester kicked-in at the end of February 2013 as the US Congress was unable to reach agreement on expenditure cuts.

The fiscal compression (about 1.8 percent of GDP), forms part of the baseline and helps to explain why, despite a strengthening private sector, US growth is projected to remain just below 2 percent in 2013. While this is the most likely outcome, the uncertainties generated by failure to agree on a medium-term plan and the kicking-in of debt-ceiling legislation could have significant additional downside effects. In a worst case scenario, where US debt was downgraded again, such uncertainties could heavily weigh on investment and consumer durable spending in the United States.

Simulations suggest that in an unlikely scenario where repeated failures to set US fiscal policy on a sustainable path result in a downgrading of US debt, growth in the United States could slow by some 2.3 percentage points – pushing the US into recession (Table 8). The Euro Area would be pushed into a deep recession, potentially increasing the risk of a second crisis there, and developing country GDP would decline by 1 percentage point relative to baseline. The bulk of these effects come from an assumed increase in precautionary savings of U.S. business and consumers of 1 and 2 percentage points, and of firms and households in other high-income countries of 0.5 and 1 percentage points, and of 0.3 and 0.7 percentage points in developing countries.

Simulations conducted on the World Bank's macro model suggests that in this scenario, Kazakhstan's GDP will decline by 1.9% (1.7%), while its current account (as % of GDP) and fiscal balance (as % of GDP) will deteriorate by 1.5% (0.5%) and 1.2% (1.2%) percent in 2013 (2014) respectively. Once more, the major transmission mechanism towards Kazakhstan's output is via the "confidence" channel – i.e. as domestic households cut back on expenditure and businesses postpone investment it contributes 1.6% and 1.2% in 2013 and 2014 respectively to the decline in real GDP.

Lower global growth also reduces the demand for commodities, which exerts downward pressure on commodity prices, thereby impacting negatively on Kazakhstan's growth by 0.3% in 2013 and 0.4% in 2014. In terms of the current account impact, the commodity price impact again dominates, contributing nearly 1% to the overall deterioration in both 2013 and 2014.

Table 8: Impact of US fiscal paralysis

US fiscal paralysis						
	Real GDP		Current account balance		Fiscal balance	
	2013	2014	2013	2014	2013	2014
	(%change in level)		(change, in % of GDP)			
U.S	-2.0	-2.0	0.5	0.5	-0.4	-0.7
World	**-1.3**	**-1.2**	**0.0**	**0.0**	**-0.5**	**-0.6**
High-income countries	-1.4	-1.4	0.1	0.1	-0.6	-0.7
Euro Area	-1.1	-1.0	0.2	0.0	-0.4	-0.5
Developing countries	-1.0	-0.9	-0.1	0.0	-0.4	-0.4
Low-income countries	-0.7	-0.5	0.1	0.0	-0.2	-0.2
Middle-income countries	-1.0	-0.9	-0.1	0.0	-0.4	-0.4
Developing oil exporters	-1.1	-1.1	-1.0	-0.6	-0.9	-0.9
Developing oil importers	-0.9	-0.8	0.3	0.2	-0.2	-0.2
East Asia & Pacific	-1.1	-1.0	0.4	0.3	-0.2	-0.2
Europe & Central Asia	-0.9	-0.8	-0.9	-0.6	-0.8	-0.8
Latin America & Caribbean	-1.1	-1.0	-0.3	-0.2	-0.6	-0.5
Middle East & N. Africa	-0.7	-0.7	-0.7	-0.4	-1.3	-1.2
South Asia	-0.4	-0.4	0.6	0.2	0.0	0.0
Sub-Saharan Africa	-0.8	-0.8	-1.1	-0.8	-0.7	-0.7
Kazakhstan	*-1.9*	*-1.7*	*-1.5*	*-0.5*	*-1.2*	*-1.2*
of which:						
commodity effect	*-0.3*	*-0.4*	*-1.5*	*-0.8*	*-0.7*	*-0.5*
confidence effect	*-1.6*	*-1.2*	*0.0*	*0.2*	*-0.5*	*-0.6*
Fiscal Cliff	*-0.1*	*-0.1*	*0.0*	*0.0*	*0.0*	*0.0*

iii. Impact of an abrupt fall in China's high investment rates (and commodity prices)

China has, on average, recorded close to 10 percent annual growth for more than 30 years and 10.3 percent growth during the first decade of this millennium, with growth as high as 14.2 percent in 2007. During most of this high-growth period, investment (and savings) were at a relatively high 30-35 percent of Chinese GDP . In the 2000s, investment rates jumped initially to 40 percent of GDP (partly in reaction to the low cost of international capital) and then again to 45 percent of GDP, because of China's fiscal and monetary stimulus plan introduced during the global financial crisis. As a result, the contribution of investment to Chinese growth rose from 2.3 percentage points during the 1980s and 1990s to around 5 percent in the 2000's. And China's capital / output ratio, which in an economy that is in a steady-state growth equilibrium will be broadly stable, has increased since 2000 by 20 percent and is still rising rapidly.

High investment rates are required to sustain the capital stock in a fast growing economy like China's. Nevertheless, such high investment-to-GDP ratios are unprecedented. Neither Japan nor Korea – two countries that also enjoyed lengthy periods of high growth – ever saw

investment rates exceed 40 percent. A level of 35 percent of GDP is seen to be more sustainable and consistent with underlying productivity growth and population growth.

China's authorities have identified the need for a more balanced pattern of investment, that implies not just a lower investment rate, but also a shift toward investments and expenditures in the service sector and in intangible assets like human capital. This can be achieved, in part, by reducing implicit subsidies that favor capital investments over investment in labor (World Bank & Development Research Center 2012, p.19). The gradual rebalancing and reduction in physical capital investment rates, is expected to be compensated for by more rapid consumption growth over an extended period of time.

China‘s economic history suggests that China, perhaps more than any other country, has the instruments to achieve such a transformation. But the challenge of orchestrating such a transition should not be underestimated. Many other countries have failed to smoothly adjust their investment profiles.

While a smooth transition is the most likely outcome and the one retained in the baseline scenario, there is a risk that the transition to a lower investment rate could happen abruptly, perhaps provoked by a failure of a significant share of new investments to realize hoped for profits, resulting in a spike in unpaid loans and a rapid tightening of credit conditions. In such a scenario, investment growth would likely come under significant pressure.

Given China‘s much increased weight in the global economy and its role as an engine of global growth, a sharp decline in investment would likely have serious consequences worldwide. Simulations suggest that a 10 percentage point deceleration in Chinese investment would cause Chinese GDP growth to slow by about 3 percentage points. The high import content of investment implies that a significant share of the slowdown leaks out as reduced imports — reducing the impact on China but extending it to the rest of the world.

Such a strong decline in investment rates, however, is unlikely, in part because of the strong policy response that such an abrupt deterioration in the investment climate would likely elicit. Table 6 presents simulation results from a smaller 5 percentage point decline in Chinese investment growth. In this scenario, the slowing in Chinese investment results in a 6.0 percent decline in Chinese imports (relative to baseline) and a 1.4 percent decline in GDP relative to baseline. Lower Chinese imports in turn reduce global exports, and world GDP declines relative to 2013 baseline by 0.5 percent and 0.3 percent for developing countries outside of China. Reflecting the composition of Chinese import demand, high– and middle-income countries are hit harder than low-income countries.

Simulations conducted on the World Bank’s macro model suggests that in this scenario, Kazakhstan’s GDP will decline by 0.9% (0.7%), while its current account and fiscal balance will deteriorate by 0.8% (0.2%) and 0.5% (0.5%) percent in 2013 (2014) respectively.

Table 9: Impact of an abrupt fall in Chinese investment

Abrupt fall in China investment						
	Real GDP		Current account balance		Fiscal balance	
	2013	2014	2013	2014	2013	2014
	(%change in level)		(change, in % of GDP)			
China	**-1.4**	**-1.0**	**1.7**	**0.9**	**-0.3**	**-0.2**
East Asia & Pacific	-1.3	-0.9	1.3	0.7	-0.3	-0.2
East Asia & Pacific (excl China)	-0.6	-0.5	0.0	0.0	0.0	0.0
World	**-0.5**	**-0.4**	**0.0**	**0.0**	**-0.2**	**-0.2**
High-income countries	-0.4	-0.3	-0.2	-0.1	-0.2	-0.2
Euro Area	-0.4	-0.3	-0.1	-0.1	-0.1	-0.2
Developing countries	-0.7	-0.5	0.4	0.2	-0.3	-0.2
Developing countries (excl China)	-0.3	-0.3	-0.3	-0.1	-0.2	-0.2
Low-income countries	-0.3	-0.2	-0.2	-0.2	-0.1	-0.1
Middle-income countries	-0.7	-0.5	0.4	0.2	-0.3	-0.2
Developing oil exporters	-0.4	-0.4	-0.5	-0.2	-0.3	-0.3
Developing oil importers	-0.8	-0.6	0.8	0.4	-0.2	-0.2
Europe & Central Asia	-0.3	-0.3	-0.5	-0.2	-0.3	-0.3
Latin America & Caribbean	-0.3	-0.3	-0.2	-0.1	-0.2	-0.1
Middle East & N. Africa	-0.3	-0.2	-0.4	-0.2	-0.5	-0.4
South Asia	-0.2	-0.2	0.0	0.0	0.0	0.0
Sub-Saharan Africa	-0.3	-0.3	-0.6	-0.3	-0.3	-0.3
Kazakhstan	*-0.9*	*-0.7*	*-0.8*	*-0.2*	*-0.5*	*-0.5*

C. Long Term Scenarios

The baseline forecast is premised on continued strong Total Factor Productivity growth, which in the baseline is forecast at around 2.5% p.a. over 2015 -2019 then gradually tapering off to around 2% by 2025. However, if policymakers can maintain a just slightly faster policy reform momentum and/or the business environment improves at a slightly faster pace than envisaged under the baseline, Kazakhstan's growth outcomes could be substantially better than the baseline suggests.

In this alternative scenario it is assumed that TFP growth is 0.5% p.a. higher than the in the baseline scenario, a very plausible outcome. Even though this 0.5% p.a. faster TFP growth pace would put TFP growth above Kazakhstan's long-term average of 1.6% p.a. between 1962 and 2012, it would still only be roughly half the TFP growth observed between 1998 and 2007.

In the simulations conducted on the World Bank's macro model, the faster TFP growth increases the Kazakhstan's sustainable growth and the rate of growth of output of the non-oil

sector. Higher productivity growth implies a progressive decline of inflationary pressures assuming nominal wages remain unchanged initially. Lower inflation helps to equilibrate real wages over the long run, and thus provokes an increase of competitiveness in export and import-competing industries. This also attracts higher levels of investment, which increases by 34 percent by 2050, when compared to the baseline (figure 5).

Higher incomes and increased competitiveness results in higher fixed investment spending, which again raises GDP growth and incomes. As a result, by 2050 the level of GDP and per capita income rises by about 26 percent, when compared to the baseline. [3] Moreover, this will raise Kazakhstan's ranking from 50th highest in 2013 to the 32nd position in terms of per capital GDP by 2050. [4]

Relative to the baseline, the increase in GDP also results in an improvement of the fiscal balance (as we assume real expenditure levels remains fixed), as tax revenues rise in line with faster GDP growth. Moreover, the increase is largely associated with the activity rising (relative to the baseline) in the non-oil sector, where tax revenues is forecast to increase by about 31.4% by 2050. Also, with lower deficits, borrowing and financing costs falls, thereby over time adding to the improving fiscal balance (We assume that real Government expenditures remains fixed, but in nominal terms it declines due to lower inflationary pressures. The current account also benefits from the increased domestic competitiveness – i.e. increased (non-oil) export and lower import volumes, but imports do rise due to higher domestic demand (relative to the baseline) and the BOP balance (as a % of GDP) improves only slightly by about 1% of GDP towards the end of the forecast period.

To summarize: TFP is central to the long(er) term growth potential of the economy and is significantly impacted by Government policy. The TFP assumptions in the baseline projection are relatively ambitious and require that the government continues to improve the environment for business by providing infrastructure, skills and continue to reduce the cost of doing business, relative to its competing peers. However, government can do even better – and just a relatively small overshooting of these assumptions will over the long run have substantial implications for real incomes in Kazakhstan. For example, just a 0.5 percentage points faster TFP growth will result in a 26% increase in per capita GDP levels in 2050 and significantly more convergence *viz-a-viz* high-income countries.

[3] Unless otherwise indicated, per capita income is based on nominal GDP per capita (weighted according to the Atlas methodology)
[4] This is based on the subset of 117 countries that we have in the macro model.

D. Numerical Simulation of Fiscal Rule Performance in the Presence of Forecast Errors

Onder and Ley (2013) explicitly simulate how alternative types of fiscal rules in Kazakhstan would perform in the event that the country suffered shocks of the size of those discussed above. Specifically, they look at both fixed rules and rules allowing some degree of flexibility. They analyze each of the alternatives for its performance in terms of smoothing economic volatility, and in maintaining the value of the NFRK over the long run.

Their results are quite striking and very important for the management of the NFRK. It is worth quoting directly from this paper:

> "In conclusion, short-term flexible fiscal rules which are designed to be countercyclical are found to be destabilizing in almost all cases under consideration. The main reason for this is the inability of the fiscal authority to determine with enough precision as to where in the business cycle the economy finds itself. Given the inevitability of the contemporaneous forecast errors, fiscal policies intended to smooth the business cycle give rise to more volatility on average than delivered by adherence to a fixed long-term fiscal rule. Another consequence of the forecast errors that lead to destabilizing fiscal policy is that the present discounted value of the GDP under the flexible rules is less than the one generated by the fixed rules. A final shortcoming of short-term fiscal rules is that they cost too much relative to the fixed ones: they withdraw more from the oil fund on average and leave behind a smaller stock of assets in the NFRK at the terminal planning period."

The conclusion is quite clear: While short run flexibility is theoretically beneficial, in reality it cannot deliver the results promised. Indeed, active countercyclical policy is likely to make volatility worse rather than better. In addition, they would be very likely to deplete the NFRK relative to what can be expected from a fixed transfer rule.

Among other results analyzed in Onder and Ley is the importance of the size of fiscal multipliers in the performance of flexible fiscal rules. Somewhat paradoxically, they find that smaller fiscal multipliers can result in higher volatility when countercyclical policies are attempted. The reason for this stems both from the countercyclical nature of the spending and the problem of inaccurate forecasting of business cycle conditions. When multipliers are smaller it is necessary to use larger amounts of spending to get a given result in terms of countercyclical effect. But if those countercyclical effects are themselves inaccurately targeted due to inaccurate business cycle forecasting then greater instability can be the result.

Another factor that is important to bear in mind when evaluating results in terms of the value of savings in the NFRK is the fact that some or even most of the expenditure can be directed toward public goods which are themselves an alternative form of "savings". In other words, when the government spends on infrastructure or other assets they have in effect transformed one asset on their balance sheet (savings in the NFRK) into another asset on their balance sheet (roads, bridges, human capital, etc.). Thus there is always a preference on economic growth grounds for expenditures to be directed toward capital-accumulating ends since these can enhance future productivity. Indeed, the standard economic presumption would be to invest in such projects up to the point where their expected returns are just equal to those that can be expected on offshore savings in the NFRK.

E. Implications of Projections and Simulations for Fiscal Rule Choice

The above simulations indicate that the maximum negative shock under any of the suggested scenarios amounts to about 2.5% of GDP. This means that even in the event that the NFRK were at its minimum required value of 20% of GDP there would be adequate reserves to offset a shock of this type under any reasonably plausible set of circumstances. However, the simulations regarding the performance of the various types of fiscal rules argues strongly against attempting to identify short run fluctuations and acting to smooth them out.

Even so, it is likely that rare, large shocks of the type experienced in the recent episode in 2008 would generate pressure to "do something" that would be politically difficult to ignore. Such a case can take comfort from the theoretical results of Engels and Montecinos that a fixed rule with an escape clause would generate almost as large a welfare gain as a theoretically optimal rule. Arguing against this are the simulation results presented here which indicate that it would be very difficult to know with any degree of certainty when such an event has occurred in real time.

Given the political realities coupled with the obvious economic dangers of excessive response, one possible course would be to limit the size of such a politically "required" response in terms of the size of the transfer that could be taken from the NFRK and for how long it could be continued. The current rule allowing for a 15% increase in transfers would seem on its surface to be just such an arrangement but it should be noted that (exactly as might be expected given political pressures) the transfers have in fact remained pegged at the top end of the specified range and are expected to remain so for the foreseeable future.

Therefore, the possibility that a shock (whether real or forecast in error) could be prolonged beyond what might be envisioned *ex ante* should not be ignored since it is in exactly these conditions that deciding on whether to continue major transfers comes to the fore. Clearly, this brings us full circle back to the conundrum examined above in which we want to know – but

cannot with any certainty – whether an observed downturn is transitory or likely to continue into the future.

For this reason, it is strongly recommended that the current modification to the NFRK transfer rule ($8 billion plus or minus 15%) be limited in time so as to avoid making it simply a mechanism for increased transfers. Rebasing the fixed transfer amount could be contemplated to allow for continuing the current quasi-fixed $9.2 billion as is, but this could well simply open the door to another de facto permanent bump of 15% over *that* number in the future. Indeed, past performance indicates that this is a likely outcome.

Interestingly, long term issues related to TFP growth – which depends on maintaining both the level and efficiency of investment in the overall economy – loom far larger than do the potential effects of external shocks. That is, the government can do more to ensure adequate levels of welfare by doing such things as ensuring a good environment for business growth than they can by transferring more money from the NFRK. In sum, the government can best act to ensure the welfare of tomorrow by making sure that the money they spend today on infrastructure, education, and an enabling environment for business is efficiently allocated to these goals.

VII. **Kopits and Symansky Criteria**

A. How to Evaluate Alternatives Rules?

There are two main issues with real-world implementation of fiscal rules identified as theoretically or numerically attractive. First, is the existence of appropriate instruments in the Kazakh fiscal system that could serve as a vehicle for a strongly countercyclical policy. Given the importance of public sector salaries as a share of overall spending, and the implausibility of varying this budget item significantly across the business cycle, other areas of the budget must be looked at as candidates for countercyclical treatment. Similarly, large infrastructure or other capital projects cannot easily be varied from year to year given their long lead times and the imperatives of construction planning. Again, other areas of the budget must be examined to play the role of "shock absorber".

The second issue is the sustainability of countercyclical policy over long and unknowable periods of time. Indeed, we are at a point in the world economy in June of 2012 when it is a matter of great debate and no small amount of disagreement whether the European Union will or will not suffer a second period of recession in the near future. If this occurs, it is similarly unknowable how long it will last. Given the strong dependence of the Kazakh economy on the performance of its main trading partners in Europe and elsewhere, it should be no surprise that this uncertainty would play a major role in Kazakh policy response.

A very useful framework for evaluating fiscal rules is laid out in Kopits and Symansky 1998 (discussed above), wherein they list the characteristics they consider to be key to the success or failure of a fiscal rule. While rather general, these criteria provide a useful framework for evaluating the different options considered in this study. The following discussion takes each of the K & S criteria in turn and compares the current fixed rule with the other leading options for a rule based approach: the Permanent Income Hypothesis based approach which depends on the present value of the wealth represented by the country's resource base and national savings; the Bird in Hand approach which allows consumption to be based only on already-extracted resource wealth (i.e on the value of the national savings fund alone and not on the value of oil still in the ground); the current rule which has a rigid numerical constraint; a countercyclical policy which would allow expenditures to increase in downturns as is the case with e.g. the Chilean copper fund rule which is based on a structural deficit estimate.

It is important to note that while some of these rules might make sense in particular circumstances, the real question to be answered in this paper is the extent to which one or another of them is clearly superior in the Kazakh case. That is, in the case of a middle income country with a very large oil sector, strong trade ties to European and other countries, and a large (relative to GDP) national fund.

As an added consideration, these characteristics must also be clearly mapped on to the institutional structure of the country involved. That is, which organ of the government (e.g. central bank, Ministry of Finance, Ministry of Economy, etc.) should be responsible for which of these functions? Who exactly will ensure compliance and impose enforcement mechanisms when needed? Perhaps the most sensitive area for concern is to determine under what circumstances any "escape clauses" would be invoked and by whom. Insulation from ordinary political processes is especially important in this case given the normal tendency of politicians to take a short term view of matters involving expenditures as well as the history of politically motivated "escapes" from fiscal rules and constraints in numerous other countries.

The Kopits-Symansky criteria are as follows:

- *Well defined* - The target variable should be clearly defined as should the institutions involved and the coverage of the rule.

If we consider the target variable to be the size of fiscal transfers to the national budget then the Kazakh government has clearly done a good job defining the issue under any of the fiscal rules under consideration. All mineral revenues accrue to the fund and it is the sole conduit for transfers to the national budget. This allows for no ambiguity or lack of definition. Under any variant of a fixed amount transfer rule the target is similarly well defined – the amount of the transfer is clear and there is no attempt to influence any other outcome.

Under the BIH rule there is similarly little scope for ambiguity – the limit on transfers relates to "money in the bank". As long as this is a publicly known amount (i.e. there are no hidden or secret accounts and no use of contingencies such as futures or options) then a rule such

as one limiting transfers to a fixed percentage of the wealth on hand is difficult to game or misunderstand.

Under a PIH rule there is some scope for differing opinions on such matters as the discount rate to be used as well as the value of oil in the ground. However, it should be possible to generate a range of plausible values using different assumptions for these values, thereby allowing the authorities to choose between, e.g. the most conservative and least conservative values that can be derived.

On the other hand, if the variable to be targeted is some measure of budgetary surplus or deficit as would be the case with a countercyclical policy rule then the problem is a bit more complicated. While there are a variety of fiscal balance concepts that could be targeted, even if there is a consensus that a well known balance such as the non-oil primary deficit should be used it is difficult to know in real time exactly where that balance lies. Similarly, there are enough judgment calls involved in computing it that it is quite possible for substantial disagreements or simple measurement error to persist for periods long enough to make consensus difficult to achieve, or for political interests to dominate debate. Indeed, these issues pose enough of a problem that countries which are often pointed to as "best cases" such as the Chilean copper fund use independent boards of experts to determine these variables.

- *Transparency* - The operation of the rule and the actions taken to ensure compliance should be clear and visible to all observers.

Many of the issues under this criterion are closely related to those under the first criterion above. While any of the proposed arrangements for fiscal rules can be made transparent in the sense that the workings of the rules and the calculations involved can be publicized, the simpler rules are much easier to make clear to the public and for those not versed in economic concepts to understand and/or report on. For example, while fixed amount rules are quite obvious to all as are rules involving fixed percentages of accounts that are owned by the government, rules involving concepts like present discounted value (as in the PIH) will not be readily understood by the general public. Countercyclical policies may be understood in the abstract (e.g. "we will increase transfers when oil prices are low") but may be more difficult to explain in terms of budget definitions which are more obscure or indeed poorly measured given existing data sources.

- *Adequacy* – The mechanisms envisioned in the rule should be capable of actually achieving the desired level of the target variable

If the goal is to prevent transmission of oil price fluctuations to the national budget then any variant of a fixed transfer rule is a good way to achieve this. In fact, the performance of the Kazakh government to date in achieving this goal could well be regarded as a model of how to do this in an effective and sustained way. Rules such as the PIH or BIH which depend more or less directly on the value of the oil wealth as calculated on the basis of market prices can in fact generate *pro*-cyclical outcomes and are not preferred policies if the goal is to smooth shocks to current income and output rather than to smooth transfers themselves. Countercyclical policies can indeed accomplish some degree of output/income smoothing but the extent to which this can

actually be achieved is never likely to be perfect (indeed, there is no historical example anywhere in the world of a 100% offset to economic fluctuations). Not only is it virtually impossible to know in real time what degree of countercyclical policy is truly necessary, but the tools at hand to achieve this goal are less than perfect even in the most optimal of cases. Accordingly, while the goals of such a policy may be laudable, the best that can be expected is that government policy would "lean against the wind" of economic cycles and at worst could even exacerbate them in cases where measurement of variables or expectations of future developments is mistaken.

- *Consistency* – The rule should be both internally consistent and also consistent with other policies and goals of economic policy.

Evaluation of this criterion is quite similar to the "adequacy" criterion above. If fixed transfers are chosen then there is little chance for inconsistency with other policies as there is no variation to generate any lack of synchronicity. In contrast, policies such as the BIH and PIH which are capable of generating procyclical results can easily generate outcomes at odds with the government's legitimate desire to smooth fluctuations in output and income. While countercyclical policies are in theory a remedy to this problem, the difficulties in implementation and measurement mean that these rules can at times be consistent with other policies and goals and at times not. Worse, this may not be clearly known until well after the fact.

- *Simplicity* – The rule should be easily stated and easily understood

The simplicity of fixed transfer rules is obvious. The BIH and PIH rules are less simple but still easily stated and understood. Countercyclical rules are much less clear in practice though in theory they can work quite well.

- *Flexibility* – The rule should be flexible enough to deal with changing economic circumstances as well as containing adequate escape or emergency clauses

Fixed transfer rules are by their very nature not flexible. It is certainly possible to alter the fixed amount to be transferred in light of changing economic circumstances but only at the cost of losing the positive attributes of a fixed transfer rule. Periodic reviews of the quantity to be transferred in light of economic growth, changing oil markets/oil production would certainly seem to be reasonable but the reputational benefits of adhering to a fixed rule would be lost in direct proportion to the extent that it is subject to frequent revision.

BIH and PIH rules are certainly flexible in that they would generate different transfer amounts in response to different oil market conditions. However, their flexibility is the opposite of what the government is seeking in its investigation of countercyclical policies.

Countercyclical rules are flexible and in the "right" direction but it must be remembered that this flexibility carries with it the risks noted above. Only in theory can a countercyclical rule be counted on to perform as desired. In practice it will be less than perfect (and at times far less than perfect) in its performance.

- *Enforceability* – The mechanisms to enforce compliance must be clear

All of the fixed transfer, PIH, and BIH based rules can be enforced by the managers of the sovereign wealth fund as has been done in past years. There is no reason to try to alter these arrangements given the excellent performance in the past. A countercyclical rule, on the other hand, would require the establishment of a mechanism to specify the state of the business cycle amd/or the structural budget deficit, an exercise which is difficult under the best of circumstances as shown by the numerical exercises comparing output forecasts with actual outcomes.

VIII. Conclusions

The various alternatives for fiscal rules under consideration in Kazakhstan all have merit in theory but generate quite different results when subjected to actual numerical simulation. Given the excellent performance to date of Kazakh economic authorities in what have in some years been rather trying circumstances, it is important not to substitute rules that could cause problems in the future under adverse economic conditions.

In particular, the proposal to use transfers from the sovereign wealth fund, the NFRK, in a countercyclical manner is an excellent one in theory but suffers in practice from the near impossibility of identifying cycles in the national economy, the national budget, or in international oil prices in a time frame that would allow such a policy to be implemented. While long run values for trends in GDP or for international equilibrium prices may be estimated, the degree of confidence we can have in such estimates given the history of past projections and the performance of the oil price itself should not be overestimated. Accordingly, rules which depend on such forecasts or estimates are likely to run into trouble in very short order. In all cases analyzed in this study, rules which allow for short term flexibility in budgetary transfers generate ***more*** volatility rather than less due to the inevitable forecast errors that will occur in even the best of cases.

Fortunately, both the recent excellent experience of the Kazakh policy makers as well as the theoretical considerations detailed in this paper show that the actual policy decisions made in Kazakhstan since 2008 are quite close to those which theoretically would gain the majority of the welfare improvements that could be hoped for even under the most optimal "perfect knowledge" policy that could be devised. Theoretical considerations show that a simple fixed transfer rule with an escape clause allows nearly as much gain in welfare as does a theoretically optimal rule.

The use of the NFRK to cushion the effects of the 2008-2009 economic crisis was a de facto implementation of a fixed rule with an escape clause, a possibility which could be readily codified in the future. Important values to be fixed in any such codification would be first, the threshold for triggering an escape clause and second, the number of years such an alternate regime could be continued before assuming the shock is chronic rather than transitory. (i.e. that the "cycle" is in reality the new "normal")

Some recent proposals have the potential to seriously change the way the NFRK is managed and how it related both to containing demand pressures and smoothing economic cycles. In particular, proposals to allow NFRK investment in domestic assets, though perhaps reasonable in particular cases, have the potential to undermine one of the most important successes of macro policy management over the past decade: insulation of the domestic economy from the overheating that can be caused by a too-rapid expansion fueled by oil revenue. In fact, avoidance of doing exactly this is why sovereign wealth funds are so important in the first place. Undermining the rationale for the NFRK in such a way cannot be defended on economic grounds and should be avoided if at all possible. In addition, the political pitfalls associated with government asset purchases in the domestic market could well be difficult to avoid as the government assumes the role of choosing where to invest and where not to.

Overall, numerical simulation and consideration of various scenarios, including "worst case" or what might be considered remote possibilities shows that the NFRK as currently constituted is well able to deal with any transitory shocks of the nature modeled in this exercise. Even a "meltdown" of the European Union does not produce a short run shock larger than can be smoothed at the present time. Longer run simulations show that the most important factor for the government is to ensure the efficiency of investment expenditures at the present time since even modest success in this has the potential to create very large increases in welfare.

However, the danger that a shock more prolonged than those analyzed here might be mistakenly perceived as transitory is a problem that is inherent in any attempt to use the NFRK to smooth economic fluctuations. Essentially, the recommendations to deal with this can be summed up as follows:

- First, implement "automatic stabilizers" to the extent possible. That is, use the structure of the tax code (by doing such things as making taxes conditional on income or profits) and the structure of expenditure programs (by doing such things as making poverty or other assistance programs conditional on income or employment status) to make countercyclical revenue and expenditure changes as automatic as possible. Such arrangements function quite well in higher income economies and can naturally be expected to develop in Kazakhstan as its average per capita income rises through time. Encouraging and speeding up these developments is indicated.

- Second, confirm the current rule fixed rule for the NFRK as suggested by Onder and Ley's simulation results but add two limiting factors for implementing any 15% deviation:

1. Specify the size shock that would trigger such a deviation

2. Impose a time limitation for how long such additional transfers could be used (e.g. two years)

Such a rule would retain the current fixed rule at a level consistent with current GDP, oil revenue and fund total holdings (e.g. $9.2 billion p.a.) but would allow an increased amount (e.g. 15%) in the event that GDP growth falls below a specified level. The two year limit is in effect an "escape from the escape clause". Other mechanisms could be envisioned but the idea is to avoid triggering an escape clause in a repeated sequential fashion.

Overall, it is important to bear in mind that simplicity is a great virtue in rules of this type. The discussion of the Kopits-Symanski criteria for evaluating fiscal rules highlights the good qualities of the current fixed rule regime while at the same time giving reason to question

the practical ability to implement a more complicated structural surplus type of rule. In fact, the excellent performance of the current rule is itself an argument for making only modest modifications and that is the recommendation of this report.

References

Arezki, Rabah "Fiscal Policy in Commodity Exporting Countries – Stability and Growth" Chapter 9 in Arezki, Gylfason and Sy, Eds. *Beyond the Curse – Policies to Harness the Power of Natural Resources* International Monetary Fund 2011.

Austvik, Ole "The generally misguided long-term oil price forecasts; Price formation and policy implications" Lillehammer University College Working Paper No. 186-209, ISSN 0806-8348.

Auty, Richard M. (Ed.), *Resource Abundance and Economic Development*, UNU/WIDER Studies in Development Economics, Oxford University Press, Oxford and New York, 2001.

Barnett, Steven and Rolando Ossowski "Operational Aspects of Fiscal Policy in Oil Producing Countries" IMF Working Paper WP/02/177, October 2002.

Barnett, Steven and Alvaro Vivanco "Statistical Properties of Oil Prices: Implications for Calculating Government Wealth" Chapter 5 in Davis, Ossowski and Fedelino eds. *Fiscal Policy Formulation and Implementation in Oil-Producing Countries,* International Monetary Fund 2003

Baunsgaard, T, M Villafuerte, M. Poplawski Ribeiro, C Richmond, "Fiscal Frameworks for Resource Rich Developing Countries" IMF Staff Discussion Note 12/04, May 16, 2012

Blanchard, Olivier and R. Perotti (2002). "An Empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output", *Quarterly Journal of Economics*.

Corden, Max "Booming Sector and Dutch Disease Economics: A Survey," *Oxford Economic Papers* 36(3), November 1984, pp. 359-80.

Davis, Ossowski & Fedelino Eds. *Fiscal Policy Formulation and Implementation in Oil Producing Countries*, IMF 2003.

Davis, Jeffrey, Rolando Ossowski, James A. Daniel and Steven Barnett, "Stabilization and Savings Funds for Non Renewable Resources: Experience and Policy Implications", Ch. 11 in Davis, Ossowski and Fedelino Eds. *Fiscal Policy Formulation and Implementation in Oil Producing Countries*, IMF 2003.

Deep, Akash " Financial Sector Reform in Kazakhstan" mimeo, Harvard University 2005.

De Gregorio, Jose and Felipe Lappe "Copper, the Real Exchange Rate, and Macroeconomic Fluctuations in Chile" Chapter 12 in Arezki, Gylfason and Sy, Eds. *Beyond the Curse – Policies to Harness the Power of Natural Resources* International Monetary Fund 2011.

Economist Intelligence Unit "Kazakhstan: Country Report" May 2012.

Engels, Eduardo and Alexis Montecinos "Fiscal Rules as Social Insurance: The Case of Kazakhstan" March 6, 2012

Erbil, Nesse " Is Fiscal Policy Procyclical in Developing Oil Producing Countries?" IMF Working Paper WP/11/171 July 2011.

Frankel, Jeffrey "On the Tenge: Monetary and Exchange Rate Policy" mimeo Harvard University, 2005.

Frankel, Jeffrey "How Can Commodity Exporters Make Fiscal and Monetary Policy Less Procyclical?" Chapter 10 in Arezki, Gylfason and Sy, Eds. *Beyond the Curse – Policies to Harness the Power of Natural Resources* International Monetary Fund 2011.

Gelb, Alan *Oil Windfalls, Blessing or Curse?* Oxford University Press 1988.

Hadri, Kaddour, "Primary Commodity Price Series – Lessons for Policymakers in Resource Rich Countries" Chapter 7 in Arezki, Gylfason and Sy, Eds. *Beyond the Curse – Policies to Harness the Power of Natural Resources* International Monetary Fund 2011.

Hamilton, Kirk and Eduardo Ley "Sustainable Fiscal Policy for Mineral Based Economies" Chapter 8 in Arezki, Gylfason and Sy, Eds. *Beyond the Curse – Policies to Harness the Power of Natural Resources* International Monetary Fund 2011.

Hare, Paul and Alexander Naumov, "A Study of Changing Income Distribution in Kazakhstan Using a New Social Accounting Matrix and Household Survey Data" Center for Economic Reform and Transformation Discussion Paper 2008/02, July 2008.

Hausman, Ricardo, "Kazakhstan's Macro Challenges Ahead: A Summary of the Views" mimeo Harvard University, 2005.

Hausman, Ricardo, "Ensuring a Competitive and Stable Real Exchange Rate: A Macroeconomic Policy Strategy" mimeo Harvard University, 2005.

Hausmann, Ricardo and Roberto Rigobon, "An Alternative Interpretation of the Resource Curse", Chapter 2 in Davis, Ossowski and Fedelino Eds. *Fiscal Policy Formulation and Implementation in Oil Producing Countries*, IMF 2003.

Hausmann, Ricardo, Dani Rodrik and Andres Velasco, "Growth Diagnostics" mimeo, Sept. 2004

Hevia, Constantino "Optimal Resource Administration under Oil Windfalls: The Case of Kazakhstan" draft, World Bank, June 2012.

International Monetary Fund "Republic of Kazakhstan: Selected Issues" IMF Country Report No. 11/151 June 2011.

International Monetary Fund (2012) "Republic of Kazakhstan: Article IV Consultation, Staff Report" (IMF Country Report No. 12/164, July 2012).

International Monetary Fund "World Economic Outlook" October 2012.

Isham, J, L. Pritchett, M. Woolcock, and G. Busby 2003 "The Varieties of the Resource Experience. How Natural Resources Export Structures Affect the Political Economy of Economic Growth" mimeo, World Bank 2003.

Katz, Menachem, Ulrich Bartsch, Harinder Malothra and Milan Cuc "Lifting the Oil Curse - Improving Petroleum Revenue Management in Sub-Saharan Africa, International Monetary Fund, 2004.

Kopits, George and Steven Symansky "Fiscal Policy Rules" IMF Occasional Paper No. 162, 1998.

Kopits, George ed. 2004 *Rules-Based Fiscal Policy in Emerging Markets: Background, Analysis and Prospects* Palgrave Macmillan, London.

Kumhof, Michael and Douglas Laxton, "Simple Fiscal Policy Rules for Small Open Economies" International Monetary Fund, June 16, 2010'

Kyle, Steven "Countercyclical Fiscal and Monetary Policy in Kazakhstan" Cornell University, December 2012.

Lücke, Matthias (2010) "Stabilization and Savings Funds to Manage Natural Resource Revenues: Kazakhstan and Azerbaijan vs. Norway" (Kiel Working Paper No. 1652).

Ministry of Planning and Finance of Timor Leste, "Establishing a Petroleum Fund for Timor-Leste", Public Consultation Discussion Paper, Ministry of Planning and Finance, October, 2004.

Naumov, Alexander "An Analysis of Kazakhstan and Its Energy Sector Using SAM and CGE Modeling" PhD Dissertation, Department of Economics, Heriot-Watt University, 2009.

Onder, Harun & Eduardo Ley, "The National Fund of the Republic of Kazakhstan and Countercyclical Fiscal Policy", PREM, The World Bank April 2013.

Robinson, James Ragnar Torvik and Thierry Verdier "Political Foundations of the Resource Curse" *Journal of Development Economics* 79 (2006) 447-468.

Romer, Christina and David H. Romer (2010). The Macroeconomic Effects of Tax Changes: Estimates Based on a New Measure of Fiscal Shocks", *American Economic Review.*

Xavier Sala-i-Martin and Arvind Subramanian, "Addressing the Natural Resource Curse: An Illustration from Nigeria" NBER Working Paper 9804, June 2003.

Samuelson, P. A. (1994), "Facets of Balassa-Samuelson Thirty Years Later", *Review of International Economics* **2** (3): 201–226.

Sturm, Michael, Francois Gurtner and Juan Gonzalez Alegre "Fiscal Policy Challenges in Oil Exporting Countries – A Review of Key Issues" European Central Bank Occasional paper Series No. 104 June 2009.

Taylor, John " An Empirical Analysis of the Revival of Fiscal Activism in the 2000's" *Journal of Economic Literature* 2011, 49:3.

Van der Ploeg, Frederick and Steven Poelhekke "Volatility and the Natural Resource Curse" *Oxford Economic Papers* (advance access) July 2009.

Van der Ploeg, Frederick "Natural Resources: Curse or Blessing?" *Journal of Economic Literature* 2011, 49:2 366-420.

Velasco, Andres, "Monetary and Exchange Rate Policy: An Alternative View" mimeo Harvard University, 2005.

Villafuerte, Mauricio and Pablo Lopez-Murphy "Fiscal Policy in Oil Producing Countries During the Recent Oil Price Cycle" IMF Working Paper WP/10/28, February 2010.

World Bank "Republic of Kazakhstan: World Bank Mission on National Fund Concept and Macroeconomic Management" Memo Aug. 3 2004.

World Bank "Republic of Kazakhstan – Getting Competitive, Staying Competitive: The Challenge of Managing Kazakhstan's Oil Boom" World Bank March 20, 2005.

World Bank "Republic of Kazakhstan – Comparative Review of Global Experiences in the Management of Natural Resource Related Sovereign Wealth Funds" World Bank April 2010a.

World Bank "Republic of Kazakhstan – Improvement of the system of accumulation, use and management of the National Fund of the Republic of Kazakhstan" World Bank June 14, 2010b.

World Bank "Kazakhstan Macroeconomic Modelling Report" DECPG April 2013

World Bank "The Fiscal Management of Natural Resource Revenues in a Developing Country Setting" PREMnotes No. 164, April 2012a.

World Bank "Kazakhstan: Prompt Recovery, Slower Growth" Kazakhstan Economic Update No. 1 2012b.

APPENDIX

Description of the National Fund of the Republic of Kazakhstan (NFRK)

Source: World Bank 2010

Type of Fund	Stabilization fund -- The main goals of the NFRK are to accumulate part of the revenues from natural resource depletion for future generations (a savings function), and to reduce the dependence on oil to meet budgetary needs (a stabilization function). Furthermore, the overall objective of the fund is to ensure efficient oil revenue management and transparency, in order to increase the welfare of current and future generations.
Date of Inception	January 2001
Rules for Contributions (What event or price triggers contributions)	Receipts for the NFRK are generated from tax receipts from the minerals sector above the amount designated for local and republican budgets. (Certain enterprises are designated as contributors to the fund; not all extracting enterprises are included. Also, the contributed revenues may be determined by a ―base‖ price, or an actual price, which appears to vary by enterprise.)
Rules for Distributions (What event or price triggers distributions)	A guaranteed amount determined in the annual budgeting process, not to exceed one-third of the Fund's assets. The guaranteed transfer should be used only to finance development budget programs designed to invest in projects that will be used by future generations as well. (See formula below)
Investment Rules and Restrictions	Consists of a stabilization portfolio (minimum 20% of the Fund) invested in short-term debt securities and an investment portfolio invested in longer-term debt and equity securities.
How Distributions are Used	Statutory limitations on the uses of revenues are defined by the President and include the following uses: (i) the execution of its stabilization function; (ii) earmarked transfers of the Fund to republican and local budgets, for purposes to be defined by the President; (iii) operational expenditure of the Fund and the conduct of the annual external audit; and (iv) reliable and liquid investments abroad.

	The NFRK may neither be used to provide credits to private or state organizations nor may it provide security for other obligations.
Reporting Rules and Disclosures	The Fund makes daily, monthly, and annual reports that it submits to the Council. The Council prepares an annual report to submit to the President on February 1 of each year. An independent external auditor (selected by the President) also makes an annual report. The report and audit are released on national (state-owned) media
Investment Management	Management is provided by the National Bank of the Republic of Kazakhstan (NBRK). A Management Council oversees the operation of the National Bank and vets all reports. The President of Kazakhstan decides the composition of the Management Council. The overall functioning of the Council is at the President's discretion. The President chairs the Management Council, which includes the Prime Minister, Chairman of the Senate of Parliament, Chairman of the Majlis of Parliament, Head of the Administration, Chairman of the National Bank, Deputy Prime Minister, Minister of Finance, and Chairman of the Accounting Committee for Controlling Execution of the Republican Budget. No representatives from trade unions, professional associations, or civil society sit on the Council. 2009/10 transfer of US$10 billion to finance a crisis response package, including (i) financial support to the top four banks through loans and capital injections; (ii) support to the construction and housing sector; (iii) financial assistance to the SME and agricultural sectors; and (iv) public investment in the industrial sector.

Formula for Guaranteed Transfer from NFRK to Fiscal Budget

The budget should be balanced such that E = Gno + Go + D, where:
E = expenditures of the national budget; G_{no} = revenues from the non-oil sector; G_o = guaranteed transfer from the Fund, which is calculated based on the average amount of expenditures of the development budget programs for the specific period; and D = net government borrowing (the difference between obtained loans and paid-back loans), with the yearly average value for a five-year period being established at the level of 1% of GDP for the corresponding year. The Value of D should not exceed the yearly average growth of the National Fund for a five-year period, which is calculated as total receipts of the National Fund minus the amount of the guaranteed transfer.
The guaranteed transfer from the Fund (G_o) is defined as a constant amount plus a portion of the National Fund's assets for previous year using the following formula: $G_o = A + b \times NFRK_{t-1} \times e$, where: G_o = guaranteed transfer from the Fund (indicated in Tenge); A = constant amount (approved by a law and indicated in Tenge); b = coefficient indicating average level of investment income for the specific period (approved by a legislative act); $NFRK_{t-1}$ = assets of the National Fund as of the beginning of a fiscal year (in base currency of the Fund); and e = Tenge exchange rate to the base currency of the Fund.

Appendix Table 1. Survey on IMF Advice to a Sample of Resource-Dependent Countries

Country	Use of Permanent Income Hypothesis (PIH) Model		Use of Price-Based Fiscal Rule	Use of Medium-Term Framework	Main Fiscal Indicator is the Non-Resource Balance
	Included in the Fiscal Framework	Indicator of Long-Term Sustainability			
Angola		X		X	X
Azerbaijan	X	X			X
Cameroon				X	X
Chad		X		X	X
Chile			X		X
Congo, Rep. of	X	X		X	X
Equatorial Guinea		X		X	X
Gabon	X	X			X
Ghana				X	
Nigeria		X	X	X	X
Norway	X	X			X
Papua New Guinea				X	X
Peru				X	
Russia	X	X			X
Timor-Leste	X	X		X	X
Trinidad&Tobago		X	X	X	X
Venezuela		X			X

Note: In some countries, the use of the PIH changed during the reviewed 2004–11 period, so the current use of the PIH may differ.

Appendix III. Elements of Fiscal Frameworks in Selected Resource Intensive Countries

Country	Rule PIH	Framework Non-PIH	Resource Fund[1]	Description
Azerbaijan	X		R	A non-oil balance guideline (2004) consistent with constant real consumption out of oil wealth. Never observed. More recently reliance on ad-hoc balanced budget oil price. Complemented by state oil fund.
Chile		X	F	Structural balance guideline (institutionalized in 2006 fiscal responsibility law). Adjustment by long-term price of copper and molybdenum (10-year forecast) as determined by an independent committee. Targets have been changed over time. Supported by two funds (stabilization and savings).
Ecuador		X	R	Various rules (e.g., non-oil balance, expenditure growth) that were mostly not observed. More recent rule states that current spending cannot exceed permanent revenue (a sort of "golden rule"). Oil funds abolished in 2008.
Equatorial Guinea		X	R	Guideline establishing that current expenditures should be limited to non-oil revenue has led to very high capital expenditure levels. CEMAC convergence criteria: include various fiscal targets (e.g., a non-oil balance target). It has a fund for future generations.
Ghana			R	A recent petroleum revenue management framework built around a stabilization fund and a heritage fund. Benchmark oil revenue is calculated at a 7-year moving average, with 70 percent used to finance the budget. Remaining revenue allocated in fixed proportions to the funds. No fiscal anchor limiting budget deficit.
Mongolia		X	R	A ceiling on the structural deficit with structural mineral revenues estimated using a 16-year moving average of mineral prices. Combined with a ceiling on expenditure growth defined by the non-mineral GDP growth rate (useful when structural revenue is growing fast). The structural balance target can be changed every four years. Flows to a stability fund linked to difference between actual and structural revenues. This framework will start in 2013.
Nigeria		X	R	3 percent of GDP deficit ceiling for federal govt. computed at budget oil price (not strictly followed). Budget oil price set every year in political negotiations, including with sub-national governments. Excess crude account receives "windfall" revenues; ad-hoc withdrawals.
Norway	X		F	"Bird-in-hand" fiscal guideline: the cyclically adjusted non-oil central government deficit as 4 percent (the expected long-run real rate of return) of the SWF assets. Guidelines are flexible: temporary deviations permitted over business cycle or if large changes in SWF value. Very strong political consensus.
PNG		X		5-year medium-term fiscal strategy that sets a ceiling to the non-mineral deficit in line with "normal" mineral revenue. A portion of "windfall" mineral revenue (70 percent) can be spent up to a non-mineral deficit ceiling of 8 percent of GDP. It was largely followed, but volatile real expenditure growth due to swings in total GDP.
Russia	X		R	The budget code includes a long-term nonoil deficit target of 4.7 percent of GDP that was suspended in 2009. Annual budgets underpinned by rolling three-year medium-term fiscal frameworks. Two oil funds (stabilization and savings).
Timor-Leste	X		F	Fiscal guideline based on PIH framework (constant in real terms). Non-oil balance set in line with estimated sustainable income (ESI), which is calculated annually as 3 percent of the sum of the petroleum fund balance and the present value of expected future petroleum receipts. Deficits can exceed the ESI if properly justified and approved by Parliament. More recently, government has scaled up public investment so that total spending amounts to more than twice the level of the ESI.

[1] Resource funds can be an account or a statutory legal entity. R = contingent (i.e., linked to threshold values) or revenue-share (i.e., flows in proportion to total revenue) funds. F = flexible (i.e., financing, linked to the overall fiscal position) funds.

OTHER A.E.M. WORKING PAPERS

WP No	Title	Fee (if applicable)	Author(s)
2014-01	Performance of Thailand Banks after the 1997 East Asian Financial Crisis		Mahathanaseth, I. and L. Tauer
2013-20	What is a "Meal"? Comparing Methods to Determine Cooking Events		Harrell, S., Beltramo, T., Levine, D., Blalock, G. and A. Simons
2013-19	University Licensing of Patents for Varietal Innovations in Agriculture		Rickard, B., Richards, T. and J. Yan
2013-18	How Important Was Marxism for the Development of Mozambique and Angola?		Kyle, S.
2013-17	Social Protection, Poverty and the Post-2015 Agenda		Fiszbein, A., Kanbur, R. and R. Yemtsov
2013-16	Impacts of local food system activities by small direct-to-consumer producers in a regional economy: a case study from upstate NY		Schmit. T.M., Jablonski, B.B.R. and Y. Mansury
2013-15	The Operational Dimensions of Results-Based Financing		O'Brien, T. and R. Kanbur
2013-14	Identifying Factors Influencing a Hospital's Decision to Adopt a Farm-toHospital Program		Smith, II, B., Kaiser, H. and M. Gómez
2013-13	The State of Development Thought		Currie-Alder, B., Kanbur, R., Malone, D. and R. Medhora
2013-12	Economic Inequality and Economic Development: Lessons and Implications of Global Experiences for the Arab World		Kanbur, R.
2013-11	An Agent-Based Computational Bioeconomic Model of Plant Disease Diffusion and Control: Grapevine Leafroll Disease		Atallah, S., Gómez, M., Conrad, J. and J. Nyrop
2013-10	Labor Law violations in Chile		Kanbur, R., Ronconi, L. and L. Wedenoja
2013-09	The Evolution of Development Strategy as Balancing Market and Government Failure		Devarajan, S. and R. Kanbur
2013-08	Urbanization and Inequality in Asia		Kanbur, R. and J. Zhuang
2013-07	Poverty and Welfare Management on the Basis of Prospect Theory		Jäntti,M., Kanbur, R., Nyyssölä, M. and J. Pirttilä

Paper copies are being replaced by electronic Portable Document Files (PDFs). To request PDFs of AEM publications, write to (be sure to include your e-mail address): Publications, Department of Applied Economics and Management, Warren Hall, Cornell University, Ithaca, NY 14853-7801. If a fee is indicated, please include a check or money order made payable to Cornell University for the amount of your purchase. Visit our Web site (*http://dyson.cornell.edu/research/wp.php)* for a more complete list of recent bulletins.